Kindred Biosciences

(KIN-NASDAQ)

Stock Rating: **Outperform(S)**
Industry Rating: **Market Perform**

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Speculative, but Many Shots on Goal; Initiating Coverage With Outperform

Investment Thesis

Kindred is a development stage biopharmaceutical company focused on the large and growing companion animal health market. The company's strategy is to repurpose human drugs for pets. Kindred has three lead products in late stage development for dogs: CereKin for osteoarthritis (OA), AtoKin for atopic dermatitis (AD), and SentiKin for post-operative pain. These products have fairly established clinical profiles in humans and there is varying degrees of evidence suggesting they will likely be active in dogs and perhaps other pets. Following its successful IPO on December 12, 2013, we believe Kindred has enough cash to develop its pipeline and establish a 50 person sales force. Importantly, Kindred is led by an experienced management team that we believe can execute the company's strategy.

Forecasts & Valuation

We estimate a 70% probability of success for the lead products and forecast peak sales of $95MM for CereKin by 2019, $30MM for AtoKin by 2020, and $64MM for SentiKin by 2021. Valuation: $15/share using DCF as well as P/E and price/sales multiple. Kindred will probably not be profitable until 2017. Thus, our DCF is based on our long-term forecasts for the three leading products, a terminal value that accounts for the rest of the pipeline, and the company's net cash position. Our DCF is supported by relative valuations: Applying an average P/E multiple of 15-19x to our 2017-2021 EPS forecasts, and discounting back, we arrive at a valuation of $16/share. Similarly, an average price/sales multiple of 3-5x our 2017-2021 revenues/share forecasts, discounted back yields $14/share. These multiples could be conservative given Kindred's growth potential based on our forecasts: 2017-2020 revenue/share CAGR: 23%, EPS CAGR: 34%.

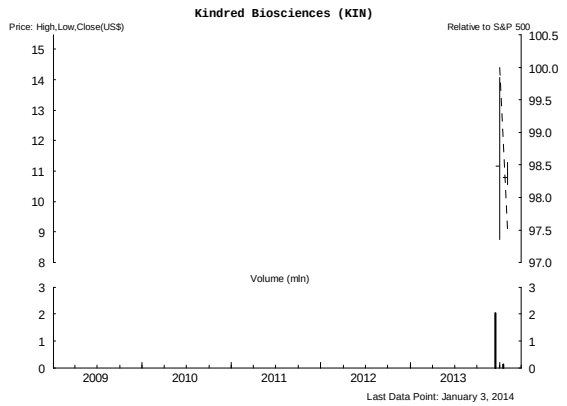
Recommendation

Kindred has a promising pipeline. We believe if some of the leading products are successful, Kindred will likely partner with or be acquired by one of the larger animal health companies (e.g. Zoetis, Eli Lilly's Elanco). As such, we rate KIN stock a speculative Outperform.

Securities Info

Price (3-Jan)	**$10.79**	**Target Price**	**$15.00**
52-Wk High/Low	$14/$9	Dividend	--
Mkt Cap (mm)	$175	Yield	--
Shs O/S (mm, BASIC)	16.2	Float O/S (mm)	8.2
Options O/S (mm)	na	ADVol (30-day, 000s)	152

Price Performance



Valuation/Financial Data

(FY-Dec.)	2012A	2013E	2014E	2015E
EPS GAAP	-$0.06	-$0.85	-$0.65	-$1.18
P/E		nm	nm	nm
First Call Cons.				
FCF	-$0.03	-$0.56	-$0.58	-$1.01
P/FCF		nm	nm	nm
Rev. ($mm)	na	$0	$0	$5
EV/Rev		na	na	35.6x

Quarterly EPS	**1Q**	**2Q**	**3Q**	**4Q**
2012A	na	na	na	na
2013E	-$0.10A	-$0.10A	-$0.40A	-$0.22

Balance Sheet Data (30-Sep)

Net Debt ($mm)	-$11	TotalDebt/EBITDA	nm
Total Debt ($mm)	$0	EBITDA/IntExp	nm
Net Debt/Cap.	nm		

Notes: All values in US$.

Source: BMO Capital Markets estimates, Bloomberg, Thomson Reuters, and IHS Global Insight.

Investment Summary

We are launching coverage on Kindred Biosciences with an Outperform (Speculative) rating and $15 price target. Kindred is a development-stage biopharmaceutical company focused on the development and commercialization of drugs for pets. On Dec. 12, 2013 Kindred became a public company when it sold a total of 8.625 million shares for a total gross capital raise of $60.4 million.

The US veterinary market is large and growing. Roughly 56% of all US households own a pet, and 63% of pet owners consider their pets to be family members. In 2011, US consumers spent $2.4 billion on pet therapeutics. Overall the companion animal health market is expected to grow by a CAGR of ~5% for the next 3-5 years. Kindred's strategy is essentially to repurpose human drugs for pets. This approach should shorten development times and lower overall risk given the products' established clinical profiles in humans.

Kindred has three lead product candidates that are in, or will shortly enter, pivotal trials. In addition to the leading three small molecules, Kindred has five potentially promising biologics in development for various conditions such as autoimmune diseases and cancer in dogs, as well as two other small molecule candidates. Kindred's goal is to launch two or more products annually for several years, starting in the second half of 2015.

The most important lead product is CereKin (Diacerein), which is in phase-3 for the treatment of osteoarthritis (OA) in dogs. The CereKin phase-3 trial should complete in 2Q14, and if successful the product should reach the US market by late 2015. CereKin's active ingredient, Diacerein, has been widely used ex-US for the treatment of OA in humans. However, the product has modest efficacy and can cause diarrhea in up to 40% of humans as well as a rare liver toxicity. Nonetheless, there are encouraging signs of activity in dogs. In a small trial with 20 dogs with surgically induced OA, Diacerein meaningfully slowed the progression (i.e., morphologic changes) of OA compared with placebo. Although there are significant differences between this trial and the CereKin phase-3 OA trial, we believe that the results indicate that Diacerein has an effect on the early stages of OA. Overall, we assign a 70% probability of success for the CereKin phase-3 trial, and forecast peak sales of $95 million for the product by 2019. The key source of differentiation for CereKin relative to commonly used NSAIDs (e.g. Zoetis' Rimadyl) will be that (1) CereKin will probably have less GI and kidney toxicity (diarrhea does not appear to be an issue in dogs at the doses being evaluated), and (2) CereKin appears to have disease modifying properties, which is a highly valuable attribute in OA.

Kindred is developing AtoKin for the treatment of atopic dermatitis (AD) in dogs. AD is an allergic skin disease that occurs in ~10% of dogs and can lead to severe itching, skin hair loss, and lesions. The active ingredient of AtoKin is Fexofenadine, which is widely used in human allergy products like Allegra. There is some data, albeit of intermediate quality, that suggest a high dose of this antihistamine is similar to oral glucocorticoids, the gold standard in AD. The AtoKin phase-3 trial is expected to start in early 2014, which should allow potential filing by late 2014 and approval by late 2015. We estimate a 70% probability of success for AtoKin, and forecast peak sales of $30 million by 2020.

Kindred is developing SentiKin for the treatment of post-operative pain in dogs and has roughly the same pivotal trial and potential regulatory timeline as AtoKin. The active

ingredient in SentiKin, Flupirtine, has been approved for the treatment of pain in humans since the 1980s in multiple countries outside the US, including 11 EU member states. Flupirtine is a centrally acting non-opioid, non-NSAID and non steroidal analgesic that has been fairly well evaluated in humans, and seems to be as effective as opioids that are commonly used in this setting. However, there is a liver safety concern with Flupirtine in humans that could be mitigated with short duration of therapy. Based on the drug's good activity in humans, we assign a 70% probability of success, and forecast peak sales of $64 million in 2021.

Kindred has enough cash to develop its current pipeline and establish a commercial presence. The company is starting 2014 with cash and cash equivalents of approximately $65 million and no debt**.** Kindred has enough cash to cover the estimated $3-5 million R&D and $5 million product launch expenses per drug, and establish a 50-person direct salesforce (complemented by distributor relationships), which should cost roughly $10 million per year to maintain.

Importantly, Kindred is led by an experienced management team that we believe can execute the company's strategy. The CEO and co-founder Dr. Richard Chin has extensive clinical research experience at companies like BioTherapeutics and Genentech. The CSO and head of R&D is Dr. Kevin Schultz, who was previously the CSO and Head of R&D at Merial (the animal health division of Sanofi). Dr. Schultz has been involved in the launch of over 20 products for animals. The Sr. VP of Regulatory Affairs is Dr. Stephen Sundlof, who from 1994 to 2008 was the Director of the Center for Veterinary Medicine (CVM) at the FDA, overseeing all veterinary products regulated by the FDA. Denise Bevers is also a co-founder of the company and brings 25 years of biopharma experience to her role as Kindred's COO.

We value Kindred Biosciences at $15/share using DCF as well as P/E and price/sales multiple. Based on our forecasts, Kindred will not be profitable until 2017. As such our primary valuation method is DCF, based on our long-term forecasts for the three leading products, a terminal value that also accounts for the rest of the pipeline, and, of course, the company's net cash position following its successful IPO. Given the low number and diversity of comparable Animal Health companies, relative valuation of Kindred is very difficult, in our view. Nonetheless, applying an average PE multiple in the range of 15-19x to our 2017-2021 EPS, and discounting back accordingly, we arrive at a valuation of $16/share. We believe the above P/E multiple range is conservative given Kindred's growth prospects during that period (2017-2020 revenue/share CAGR: 23%, EPS CAGR: 34%). Similarly, applying an average price/sales multiple 3-5x our 2017-2021 revenues/share forecasts, and discounting back accordingly, we arrive at a valuation of $14/share. This could also prove conservative because we believe there is a good chance that Kindred will likely be acquired by one of the larger animal health companies (e.g. Zoetis, Eli Lilly) at 7-8x sales. The average of these two relative valuations is in-line with our $15/share DCF valuation. Please see Exhibit 8 for details.

Exhibit 1. We Are Adding Kindred to Our Coverage Universe With an Outperform(S) Rating and $15 Price Target

Company	Ticker	Rating	01/03 Close	Mkt Cap (millions)	Target Price	Total Return	Next PE	Yield
U.S. Major Pharma								
AbbVie Inc.	ABBV	OP	$52.30	83,202	$58	14%	16.0	3.1%
Bristol-Myers Squibb Co.	BMY	Mkt	$52.85	87,020	$56	9%	30.0	2.7%
Eli Lilly & Co.	LLY	Mkt	$51.10	57,572	$50	2%	21.1	3.8%
Merck & Co., Inc.	MRK	OP	$49.73	145,307	$54	12%	14.2	3.5%
Pfizer, Inc.	PFE	OP	$30.52	197,802	$36	21%	13.2	3.4%
Canadian Pharma								
Valeant Pharmaceuticals International, Inc.	VRX	OP	$117.16	39,011	$132	13%	13.9	0.0%
Paladin Labs Inc.	PLB	Mkt	$114.31	2,396	$118	3%	36.1	0.0%
Animal Health								
Zoetis Inc.	ZTS	OP	$32.05	16,025	$38	19%	20.8	0.9%
Kindred Biosciences, Inc.	KIN	OP	$10.79	175	$15	39%	nm	0.0%

Source: Thomson ONE, BMO Capital Markets Pharmaceuticals Research.

Company Description

Incorporated in September 2012, Kindred Biosciences is a development stage biopharmaceutical company focused on the development and commercialization of small molecules and biologics aimed at improving the health of pets. The company's strategy is to identify compounds and targets that have already demonstrated safety and efficacy in humans and to develop therapeutics based on these validated compounds and targets for pets, primarily dogs, cats, and horses. This approach should shorten development times and improve approval rates compared to pursuing new, non-validated compounds and targets. Kindred has three product candidates that are in, or will shortly enter, pivotal trials: CereKin (Diacerein) is in phase-3 for the treatment of osteoarthritis (OA) pain and inflammation in dogs; the phase-3 trial should complete in 2Q14, and if successful the product should reach the market by late 2015. AtoKin is being developed for the treatment of atopic dermatitis in dogs; the phase-3 trial is expected to start in early 2014, which should allow potential filing by late 2014 and approval by late 2015. SentiKin is in development for the treatment of post-operative pain in dogs and has the same pivotal trial and potential regulatory timeline as AtoKin. Kindred's goal is to launch two or more products annually for several years, starting in the second half of 2015.

Pet Therapeutics Market

The US companion animal health market is large and growing. US consumers spent an estimated $53 billion on their pets in 2012, according to the American Pet Products Association, or APPA, an increase of 38% from 2006. In 2011, approximately $4.3 billion was spent on parasiticides and vaccines and approximately $2.4 billion was spent on pet therapeutics. There are several indicators that suggest spending on pets should continue to grow. Roughly 56% of all US households own a pet, and 63% of pet owners consider their pets to be family members, and another third feel their pets are their companions (Source: American

Veterinary Medical Association or AVMA). There are roughly 70 million pet dogs in the US (~37% of households have at least one), and almost 15% are older than 11 years. Overall, US pets are living longer than ever before and are more overweight, thus increasing the incidence of conditions such as osteoarthritis. The mean veterinary expenditure per dog owning household was $378 in 2011, an increase of $22 per household since 2006, resulting in a 6.2% increase per household in veterinary expenditures in the past five years (1.2% compound annual rate) (Source: AVMA). About 22% households had expenditures of $500 or more in 2011, a 6.8% increase since 2006, suggesting that a significant portion of pet owners are willing to pay for relatively expensive healthcare for their dogs.

Exhibit 2. Distribution of Dog-owning Households by Veterinary Expenditures and Mean Expenditure per Household, per Visit and per Dog, 1987-2011. In 2011, About 22% of Households Spent More than $500 For Their Dog's Healthcare.

	1987	1991	1996	2001	2006	2011
Expenditures	**%**	**%**	**%**	**%**	**%**	**%**
No expenditures	*	*	17.4	18.9	20.9	20.1
Less than $50	*	*	11.4	6.8	4.5	4.0
$50 to $99	*	*	17.9	13.1	8.9	9.2
$100 to $199	*	*	21.5	19.4	15.8	17.9
$200 to $499	*	*	23.4	27.3	29.4	26.9
$500 to $999	*	*	6.1	9.6	12.1	12.7
$1,000 or more	*	*	2.2	4.9	8.4	9.2
Mean per household ($)	**83**	**132**	**187**	**261**	**356**	**378**
Mean per visit ($)	**35**	**50**	**74**	**99**	**135**	**146**
Mean per dog ($)	*	*	**129**	**179**	**200**	**227**

Source: American Veterinary Medical Association: U.S. Pet Ownership & Demographics Sourcebook (2012 Edition).

A number of unique features make the US veterinary market attractive, in our view. First, this is mostly a private or cash pay market and pet owners make decisions regarding available treatment options primarily based on the advice of their veterinarians, rather than on the treatment options' eligibility for reimbursement by insurance companies or government payers. As a result, there is less generic competition in the pet therapeutics industry than in the human therapeutics industry. Approximately 14% of veterinary drugs face generic competition, yet the percentage of generic prescriptions in the veterinary space is only 7% compared to approximately 81% for human drugs. Finally, in the US, veterinarians generally serve the dual role of doctor and pharmacist, and pet owners typically purchase medicines directly from their veterinarians. Dispensing pet therapeutics is a significant source of direct and indirect (follow-up visits) revenue for veterinarians; thus, incentivizing treatment

CereKin (Diacerein) for OA in Dogs; Kindred's Lead Product

CereKin is an oral, chewable, beef-flavored formulation of Diacerein, an interleukin-1 beta inhibitor that Kindred is developing for osteoarthritis (OA) pain and inflammation in dogs. Diacerein is a slow-acting medicine that blocks the actions of interleukin-1 beta, and other cytokines that are believed to act in the earlier stages of the inflammatory cascade in OA. Diacerein acts differently than traditional non-steroidal anti-inflammatory drugs (NSAIDs),

which inhibit prostaglandin synthesis occurring at later stages of the OA process. Some studies suggest that Diacerein could have disease-structure modifying properties in OA.

Diacerin for Treatment of OA in Humans: Considered Modestly Effective, but That's OK; so Was the Leading Pet NSAID Rimadyl

Diacerein-containing medicines have been available for human use in a number of ex-US markets since at least the early 1990s, including the following EU Member States: Austria, Czech Republic, France, Greece, Italy, Portugal, Slovakia, and Spain. Diacerein is generic ex-US and is marketed by a number of companies, including Sanofi-Aventis, Mylan, and Actavis. A published analysis of seven studies including 2,069 participants demonstrated a small, consistent, beneficial effect of Diacerein in the treatment of OA. (Source: Fidelix TS, Soares BG, Trevisani VF; UNIFESP [Escola Paulista de Medicina], Internal Medicine and Therapeutic).

Safety profile in Humans: Diacerein Has a Relatively high incidence of diarrhea, as well as rare liver side effects; this has led to the suspension of Diacerin containing medicines across the EU. In humans, the most frequent adverse event of Diacerein is diarrhea, and it usually affects about 20-40% of treated patients. In November 2013, The EMA's Pharmacovigilance Risk Assessment Committee (PRAC) recommended the suspension of Diacerein-containing medicines across the EU. This follows a review that concluded that the benefits of Diacerein in humans did not outweigh its risks, particularly the risk of severe diarrhea and potentially harmful, albeit rare effects on the liver.

CereKin in Phase-3 Pivotal Trial for OA in Dogs

CereKin is currently in a pivotal phase-3 trial for the treatment of OA in dogs. The trial is evaluating CereKin (5 mg/kg and 20 mg/kg) twice daily versus placebo. The primary endpoint is change in the Canine Brief Pain Inventory (CBPI) at 8 weeks. This trial was initiated in August 2013 under FDA Protocol Concurrence (similar to human Special Protocol Assessment). The company expects the trial to complete in 2Q14 and plans an NADA filing in mid-2014, setting the product on track for potential FDA approval in mid-2015.

The CBPI is a commonly used tool in OA trials with dogs. The CBPI is an owner-completed questionnaire designed to quantify the severity and impact of chronic pain in companion dogs with osteoarthritis.(Please see Exhibit 25 for a copy of the questionnaire.) It contains four questions pertaining to the severity of pain on a scale ranging from 0 to 10 (the responses for these questions can be added and used to calculate a mean value that can provide a pain severity score), and six questions pertaining to how the pain interferes with the dog's typical activities on a scale ranging from 0 to 10 (the responses to these questions can also be added and be used to calculate a mean value that can provide a pain interference score). Overall, the responses can be added for a maximum CBPI total score of 100 for the most severely rated pain. Therefore, improvements in CBPI are measured as reductions in the total score. Finally, there is one qualitative question regarding the owner's overall impression of the dog.

The literature suggests that the CBPI has excellent reliability and validity, and is able to detect improvements in pain scores in dogs with osteoarthritis treated with an NSAID or a placebo. (Source: Brown DC, et al. Am Vet Med Assoc. 2008; 233(8): 1278–1283). The questions in CBPI were generated through information gathered from focus groups of dog owners and an expert panel of veterinarians, and the final questionnaire has been subjected to factor-analysis,

reliability, and validity testing (Source: Brown DC. Et al. *Am J Vet Res* 2007;68:631–637). We spoke with a number of veterinarians with extensive clinical trial experience, and they indicated to us that the CBPI is a commonly used tool in such trials, and its results are considered to be clinically relevant.

Overall we assign a 70% probability of success for the CereKin phase-3 trial.

Perhaps, the most relevant trial that indicates Diacerein has efficacy for the treatment of OA in dogs is a trial with 20 dogs with surgically induced OA (Smith et al., *Arthritis & Rheumatism*, 1999). In this trial, OA was surgically induced in 20 adult dogs, and the animals were treated with 20mg/Kg Diacerein twice daily (i.e., same as the high dose being studied in the phase-3). Dogs in the control group received placebo. The severity of gross joint damage was assessed in a number of ways, including an SFA (Societe Francaise d'Arthroscopie) severity score, and the scores for each lesion were summed to provide a total joint score. The trial showed that Diacerein treatment slowed the progression (i.e., morphologic changes) of OA compared with placebo), as measured by grading of gross changes in the knee based on arthroscopy assessment at 16 weeks post surgery.

Although, there are a number of important differences between this trial and the ongoing phase-3, we believe the results suggest that Diacerein had an effect on the early stages of OA. Below, we outline the key differences in this trial vs. the ongoing phase-3 and attempt to reconcile the two in order to make our predictions for the phase-3 outcome:

1. This trial uses dogs with surgically induced OA, not naturally occurring OA.
    a. Implications and our views: Surgically induced disease models tend to be more rapidly progressive than the natural course of disease. Therefore, Diacerein's activity in this model is a positive in our opinion because it should predict activity in the actual disease, which should progress more gradually.
2. The study uses SFA severity score and not CBPI. Moreover, the SFA scores were measured at weeks 16 and 32, whereas the CereKin phase-3 trial is only 8 weeks in duration.
    a. This is the most valid concern about this study, in our view, and is particularly relevant because Diacerein is a slow acting drug. However, we believe the concern is addressable. In this study, treatment with Diacerein 20mg/Kg BID, i.e., the same as the high dose in the phase-3, produced significant reduction in pathological changes of OA in a model that is probably more aggressive than naturally occurring OA in dogs. Therefore, we believe that it is reasonable to extrapolate that less severe progression of OA (i.e., better SFA scores) should correlate with improvements in pain and function as measured with CBPI. In fact, one could argue that it is often more difficult to show improvements in structural disease progression (i.e., improve SFA score) relative to improvements in disease symptoms (i.e., CBPI score). However, we appreciate that this reasoning is speculative.

Other important differences and factors that we believe are positive indicators for the CereKin phase-3:

1. **With its large sample size, the CereKin phase-3 trial should be highly powered to meet the primary efficacy objective vs. placebo.** The phase-3 trial has a target enrollment of 375 evaluable dogs (initial planned enrollment was 300). The primary efficacy variable is the CBPI response rate, with a response defined as a composite of a reduction of at least 15 points on the CBPI total score, as well as no worsening of the general impression score on the CBPI, from the Day 1 visit to the Week 8 visit. According to Kindred management, the study is estimated to be 90% powered to detect a 25% difference between the placebo and CereKin arms in terms of percentage of responders. The key assumptions are that 45% of the dogs in the placebo arm respond vs. at least 70% in the CereKin arm. To provide some context, the data with Rimadyl indicates that a double blind trial with only 70 dogs with OA (35 dogs treated with Rimadyl vs. 35 treated with placebo) would have 80% power of detecting differences between the groups of at least 30% change in CBPI scores (SD, 40%; P = 0.05). (Source: Brown DC, et al. Am Vet Med Assoc. 2008; 233(8): 1278–1283).

2. **Diacerein was well tolerated by the dogs in this small trial and was not associated with diarrhea, a key issue for the drug when used in humans.** Recall that this study used the highest dose of Diacerein being evaluated in the phase-3 (i.e., 20mg/Kg BID) and only some dogs developed loose stools, but none developed diarrhea. Diarrhea has been seen in dogs treated with higher doses of Diacerein (Source: Smith et al.; *Arthritis & Rheumatism*, 1999).

Overall, based on the clinical profile outlined above, we assign a 70% probability of success for CereKin in dogs with OA. The drug clearly has activity in OA, and we believe that it will probably beat placebo in the phase-3 study. On average, following 8 weeks of treatment, CereKin needs to show a 1-2 point improvement (i.e., reduction) on the 10 quantifiable measurements in the CBPI, without worsening of the general impression score, to meet the primary endpoint.

The key risk in this trial, in our view, is that Diacerein is slow acting in humans and is considered to be modestly effective in treating the symptoms of OA; therefore, eight weeks may not be enough for the drug to show clinically meaningful improvements in CBPI in dogs. In humans, Diacerein's effects become apparent 2-4 weeks after the start of treatment, reaching significant value after 4-6 weeks, but the benefits persist for several months after administration ceases. However, as we discussed above, the threshold for demonstrating efficacy in the phase-3 trial seems rather low (i.e., 15 point improvement in CBPI after eight weeks).

Although this clinical profile is not ideal for a symptomatic treatment, it does support the hypothesis that Diacerein has disease modifying properties. As discussed below, this could be a significant differentiator for CereKin. Nonetheless, as illustrated by the success of Rimadyl, in OA modest efficacy in humans does not necessarily translate to modest efficacy in dogs. Similar to Rimadyl, CereKin could also prove highly effective in dogs, despite modest activity in humans.

CereKin's disease modifying properties won't be studied in the ongoing phase-3, but the drug clearly has this potential. In an animal model study, treatment with Diacerein prevented progression of spontaneous osteoarthritis in mice as assessed by radiographic evaluation of joint space narrowing, deformation of the joint surfaces, and bone erosions. In an accelerated canine model of OA, Diacerein (15–20 mg/kg once daily for eight weeks) did not significantly modify

the severity of cartilage lesions and proteoglycan level contained in OA cartilage (Brandt et al., Osteoarthritis and Cartilage, 1997). However, as discussed above, in a less rapidly progressive canine model, which is closer to the natural OA condition, Diacerein (40 mg/kg/24h for eight months) was shown to slow down the progression of cartilage lesions as estimated by an arthroscopic grading scale (Smith et al., *Arthritis and Rheumatism*, March 1999).

In humans, two long-term studies, one evaluating hip OA and another evaluating knee OA, analyzed structural progression with radiographic measurements of joint space. In hip OA, there was statistically significant slowing of progression; in contrast the knee OA study did not demonstrate this reduction. Importantly, in the hip study, patients completed three years of treatment; nonetheless, the overall effect was very different between studies (P=0.04 for hip OA and P= 0.85 for knee OA). (Source: Fidelix TS, Soares BG, Trevisani VF; UNIFESP, Escola Paulista de Medicina, Internal Medicine and Therapeutic; Dougados et al. *Arthritis & Rheumatism*, 2001, 2539-2547). Kindred is currently in discussions with the FDA regarding regulatory requirements for a disease modifying claim for dogs with OA. The company expects to begin a study for this indication in 2014.

Our CereKin Forecast: Peak Sales of $95 Million by 2019

Based on our proprietary survey with 30 veterinarians (please see appendix for full survey results) and other sources, we estimate that at least 20% of dogs seen by vets need treatment for OA, but only ~50% of these are actually treated. Since there are roughly 70 million pet dogs in the US, and about 80% of dog owning households take their dogs to the Vet at least once, we estimate that roughly 5.5-6 million dugs receive some treatment for OA in the US (70 million dogs x 80% seen by vets x 20% with OA x 50% treated for OA).

The main source of differentiation for CereKin relative to the NSAIDs commonly used for OA in dogs is that CereKin has a different mechanism of action. The gastrointestinal safety issues as well as the need for kidney monitoring with NSAIDs are well understood by most Vets. Therefore, if CereKin can show similar efficacy to the NSAIDs, with lower potential for GI, kidney and liver toxicities, then it should be able to compete, in our view. The key safety signal to watch with CereKin will be diarrhea, which can be severe in humans, and liver toxicity.

We conservatively assume that CereKin can gain at most 3% market share among dogs treated for OA. Based on our market research, we estimate that Kindred can charge roughly $2/day for CereKin, and on average we assume 75% compliance rate in a three-month treatment period. As a result, we forecast that CereKin can reach peak sales of roughly $95 million by 2019. However, we assign a 70% probability of success for this program and only include our risk-adjusted revenues in our financial model. Moreover, the data available so far suggest that Diacerein's clinical benefits improve over time; thus, CereKin will likely be used in dogs with earlier stage OA and duration of treatment will likely be longer compared to NSAIDs.

Importantly, our forecasts do not assume that CereKin will show disease modifying properties in dogs with OA. Clearly, this would be a significant differentiator relative to the NSAIDs; however, given the uncertainty associated with this indication based on the ongoing discussions with the FDA we did not include this in our forecasts.

Exhibit 3. Our CereKin Forecast for Osteoarthritis in Dogs

Cerekin - Osteoarthritis (OA)	2015E	2016E	2017E	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E
Pet Dogs being seen by a Vet at least once, MM	**59.0**	**59.6**	**60.1**	**60.5**	**61.0**	**61.5**	**61.9**	**62.4**	**62.9**	**63.3**	**63.8**
Percentage of dogs seen by Vets that need Rx treatment for OA (Source: BMO Market Research)	20.2%	20.3%	20.3%	20.4%	20.4%	20.5%	20.5%	20.6%	20.6%	20.7%	20.7%
Growth rate	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%
Number of dogs seen by Vets that need Rx for OA, MM	11.9	12.1	12.2	12.3	12.4	12.6	12.7	12.8	13.0	13.1	13.2
% of dogs seen by Vets that are actually treated	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
Number of dogs undergoing treatment for OA, MM	6.0	6.0	6.1	6.2	6.2	6.3	6.3	6.4	6.5	6.5	6.6
CereKin Market Share Among Treated Dogs	0.4%	1.1%	2.0%	2.6%	2.8%	2.7%	2.4%	2.0%	1.8%	1.6%	1.4%
Sequential Change		0.75%	0.88%	0.55%	0.20%	-0.04%	-0.36%	-0.31%	-0.25%	-0.20%	-0.16%
Number of dogs treated with Cerekin	22,360	67,925	121,972	157,080	171,104	170,435	149,358	130,789	115,885	103,944	94,398
Avg. Price per Qtr, $/Qtr	**$135**	**$135**	**$135**	**$136**	**$138**	**$139**	**$140**	**$142**	**$143**	**$145**	**$146**
Y/Y Change			0%	1%	1%	1%	1%	1%	1%	1%	1%
Cerekin Sales in Dogs w OA, $MM	**$6**	**$37**	**$66**	**$86**	**$94**	**$95**	**$84**	**$74**	**$66**	**$60**	**$55**
Y/Y Change		508%	80%	30%	10%	1%	-11%	-12%	-11%	-9%	-8%
Risk adjusted sales for Cerekin based on our 70% probability of success in dogs with OA, $MM	**$4**	**$26**	**$46**	**$60**	**$66**	**$66**	**$59**	**$52**	**$46**	**$42**	**$39**
Y/Y Change		508%	80%	30%	10%	1%	-11%	-12%	-11%	-9%	-8%

Source: US Pet Ownership & Demographics Sourcebook 2012 edition, Kindred Biosciences, BMO Capital Markets Pharmaceuticals Research

AtoKin (Fexofenadine) for Atopic Dermatitis

Atopic dermatitis (AD) is a common, potentially chronic, relapsing allergic skin disease that affects about 10% of dogs. Progressive AD disease is characterize by severe itching (pruritus) and scratching that could lead to skin hair loss, scabs, crusts and secondary bacterial infections. Treatment approaches vary for acute flares or chronic AD, and whether skin lesions are localized or extensive. The first and usually most effective long-term solution is to change the dog's living circumstances to avoid the allergen causing the condition; however, this is often not possible. Antihistamines control itching and scratching in 20-40% of atopic dogs. Corticosteroids are the most effective anti-itch drugs, but they also have the most serious side effects, which is why they are best used in low doses and for a limited time. Topical glucocorticoid sprays such as Genesis and Cortavance (both from Virbac) can be used for localized skin lesions for short periods. However, more severe or extensive cases can be treated with a short course of oral glucocorticoids. Either prednisone, prednisolone or methylprednisolone can be given at 0.5 mg/kg once to twice daily until clinical remission. Side effects of oral glucocorticoids are usually proportional to drug potency, dosage and duration of administration. (Source: Olivry et al. International Task Force on Canine Atopic Dermatitis, *Veterinary Dermatology*, 2010).

AtoKin is a high-dose, oral, chewable, beef-flavored formulation of Fexofenadine that Kindred is developing for AD in dogs. The active ingredient in AtoKin is an antihistamine that is approved for allergic conditions in humans such as seasonal allergic rhinitis (trade names: Allegra, Telfast, and others).

The AtoKin phase-3 study is a multi-center, randomized double-blind, placebo-controlled study that is expected to enroll 200 dogs. The study will compare AtoKin 20mg/Kg once daily vs. placebo. The co-primary endpoints are CADLI score: Canine Atopic Dermatitis Lesion Index of six clinical symptoms associated with AD evaluated in five body regions, and PVAS scores: a zero-to-ten analog pruritus scale.

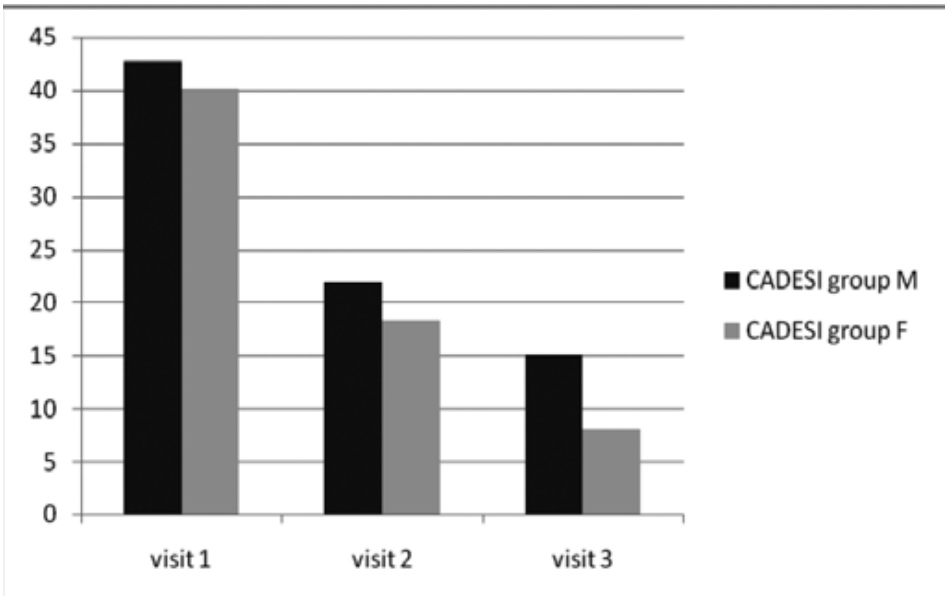
A Small Trial Suggests That AtoKin Could be as Efficacious as Oral Glucocorticoids, the Standard of Care

The key trial that supports the AtoKin phase-3 study is a small study (15 dogs per treatment group) comparing Fexofenadine (Fex) 18mg/Kg per day vs. Medrol (methylprednisolone) 0.5mg/Kg per day (Source: Plevnik et al. Slovenian Veterinary Research, 2009). This was a non-inferiority trial that suggests the treatments have similar efficacy. (Please see exhibits below for the results). However, there are some concerns about the power analysis of this study. As illustrated below, the majority of dogs from both study groups experienced lowering of CADESI (Canine Atopic dermatitis Extent Severity Index) score parameters from the start to conclusion of the treatment, but this was later on statistically evaluated. That's the key issue with this study; "there was no report of a power analysis done beforehand to justify such a small number of dogs in this non-inferiority trial; this study was probably underpowered." (Olivry, *Veterinary Dermatology*, 2013).

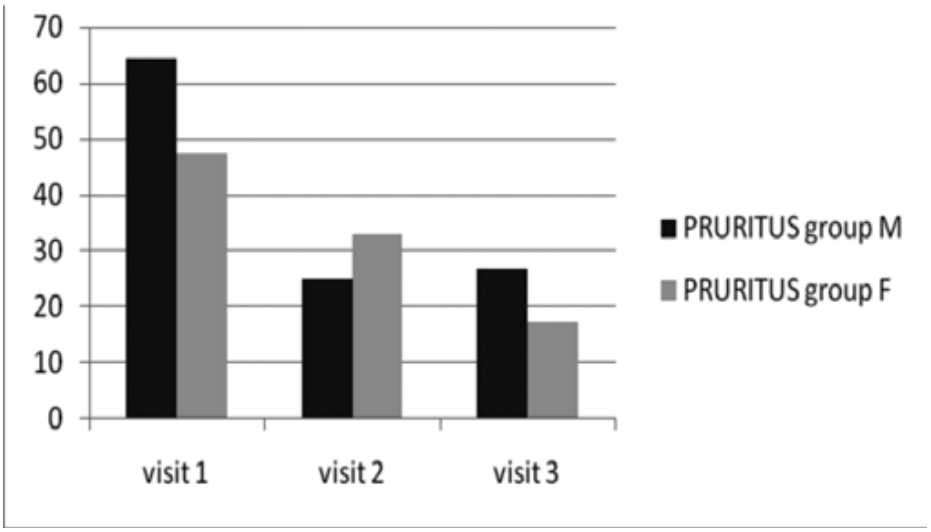
The other issue is that the Plevnik study used the CADESI-02 scale, whereas the AtoKin phase-3 is using the CADLI scale. Although this makes it more difficult to extrapolate the results of the Plevnik study to the AtoKin phase-3 study, the scientific literature suggests that the CADLI score is better. The reliability of the CADESI-02 score has been found to be "less than desirable for a health measurement scale" (Sources: Germain, Rev Med Vet 2005; 156: 382–385; Plant, Veterinary Dermatology, 2012). The third version of CADESI, CADESI-03, is the only scale that has been "rigorously validated" for assessment of AD but it very inconvenient because of the length of time it requires for use. The CADLI score has been found to be strongly correlated with CADESI-03 (r=0.84) and it is much easier to use. Overall, the CADLI score has been found to be a simple and effective measure of AD lesion severity in dogs. (Source: Plant, Veterinary Dermatology, 2012).

We estimate a 70% probability of success for the AtoKin phase-3 study. In general, antihistamines control itching and scratching in 20-40% of atopic dogs. (Source: Olivry, *Veterinary Dermatology*, 2010). Moreover, as stated above, there is some data, albeit of intermediate quality, that suggests high dose Fex is similar to Medrol, the gold standard in AD. The Fex dose in the phase-3 trial (20mg/kg) is similar to the dose in the Plevnik trial (18mg/Kg). Therefore, we believe there is a strong probability that AtoKin will beat placebo. Kindred has already obtained Protocol Concurrence for the AtoKin phase-3 trial, which is expected to start in early 2014. Kindred plans an NADA filing in the second half of 2014, which would put AtoKin on track for potential FDA approval in late 2015.

Exhibit 4. A Small Trial in 30 Dogs Suggests High Dose Fex Has Similar Efficacy to Methylprednisolone, the Standard of Care in AD



Note: Visits 1, 2 and 3 = baseline, after 3 weeks of treatment and after 6 weeks of treatment; Group M = methylprednisolone treated; Group F = Fexofenadine treated



Source: Plevnik et al. *Slovenian Veterinary Research*, 2009

Our AtoKin Forecast: $30 Million Peak Sales by 2020

We forecast that AtoKin can reach the market in 4Q15. Our market share and pricing assumption are outlined below, and are in part based on our market research survey with 30 veterinarians treating AD in dogs. (Please see Appendix for full survey results.) In general, we forecast that AtoKin can gain ~7% peak market share in dogs treated for AD. We estimate that Kindred can charge roughly $1/day for average treatment duration of 30 days. As illustrated

below, we forecast that Atokin can reach peak US sales of $30 million in 2020. However, given our 70% probability of success, we only include the risk adjusted sales in our financial model.

Exhibit 5. Our AtoKin Forecast for Atopic Dermatitis in Dogs

AtoKin - Atopic Dermatitis (AD)	2015E	2016E	2017E	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E
Pet Dogs being seen by a Vet at least once, MM	**59.0**	**59.6**	**60.1**	**60.5**	**61.0**	**61.5**	**61.9**	**62.4**	**62.9**	**63.3**	**63.8**
Percentage of dogs visiting vets that are diagnosed with AD (Avg. 10% of dogs, but higher among those taken to Vets).	12.1%	12.2%	12.2%	12.3%	12.3%	12.4%	12.4%	12.5%	12.5%	12.6%	12.6%
Growth rate	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%
Number of dogs diagnosed with AD, MM	7.1	7.2	7.3	7.4	7.5	7.6	7.7	7.8	7.9	7.9	8.0
% of dogs with AD that are actually treated by Vet (Source: BMO Proprietary Survey)	47%	47%	47%	47%	47%	47%	47%	47%	47%	47%	47%
Number of dogs undergoing treatment for AD, MM	3.4	3.4	3.4	3.5	3.5	3.6	3.6	3.7	3.7	3.7	3.8
AtoKin Market Share Among Treated Dogs	0.3%	1.8%	3.5%	4.9%	6.0%	6.8%	6.3%	5.6%	5.1%	4.6%	4.3%
Number of dogs treated with AtoKin	8,393	59,593	120,584	170,795	212,288	243,122	228,040	205,135	186,834	172,262	160,710
Avg. Price per Qtr, $/Qtr ($1/day for 1 month; Source: BMO Proprietary survey with 30 Vets treating AD).	**$30**	**$30**	**$30**	**$31**	**$31**	**$31**	**$32**	**$32**	**$32**	**$32**	**$33**
Y/Y Change			1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
AtoKin Sales for Dogs with AD, $MM	**$1**	**$7**	**$15**	**$21**	**$26**	**$30**	**$29**	**$26**	**$24**	**$22**	**$21**
Y/Y Change			104%	43%	26%	16%	-5%	-9%	-8%	-7%	-6%
Risk adjusted sales for AtoKin based on our probability of success (70%)	**$0**	**$5**	**$10**	**$15**	**$18**	**$21**	**$20**	**$18**	**$17**	**$16**	**$15**
Y/Y Change			104%	43%	26%	16%	-5%	-9%	-8%	-7%	-6%

Source: US Pet Ownership & Demographics Sourcebook 2012 edition, Kindred Biosciences, BMO Capital Markets Pharmaceuticals Research

SentiKin (flupirtine) for Post-Operative Pain

Pain management in animals at perioperative and postoperative periods presents a significant challenge not only for veterinarians, but also for pet owners. There is no absolute standard of care. The selection of agents and methods for pain control depend on the type of procedures, severity of pain and economic consideration in each case. There are a number of options available, including, NSAIDs like Rimadyl (for less severe pain) and opioids (for more severe pain). Fentanyl is a very potent short acting opioid analgesic with a quick onset of action that is very popular in the post-operative setting. Eli Lilly's Elanco division recently launched Recuvyra, the first transdermal Fentanyl solution for the postoperative pain associated with major orthopedic and soft tissue surgery. One dose of Recuvyra provides at least four days of opioid analgesia. However, Fentanyl is associated with significant sedation and respiratory depression. Moreover, it is a controlled narcotic, which makes it difficult to use for out-patients post-surgery. For example, with Recuvyra, owners are cautioned to avoid contact with the drug application site for 72 hours. Veterinarians are required to be certified by completing an online training program to able to use Recuvyra.

SentiKin (Flupirtine) is a centrally acting non-opioid, non-NSAID, and non-steroidal analgesic that Kindred is developing for management of post-operative pain in dogs, cats, and horses. The active ingredient in SentiKin, Flupirtine, has been approved for the treatment of pain in humans since the 1980s in multiple countries outside the United States, including 11 EU member states. Flupirtine was first introduced as an alternative painkiller to opioids and NSAIDs.

Flupirtine has been fairly well evaluated in humans and seems to be as effective as opioids. In a short seven-day study in patients with sub-acute low back pain, Flupirtine 100mg

TID showed an overall pain relieving efficacy comparable to Tramadol, and was well tolerated (Source: Li et al., 2008). In another study, Flupirtine showed superior efficacy vs. Tramadol for cancer associated pain (Source: Luben et al, 1994). Flupirtine 100mg has also showed comparable post surgery pain reliving properties compared to diyhdrocodeine 60mg (Source: Moore et al, 1983).

However, there is a liver safety concern with Flupirtine that could be mitigated with short duration of therapy. A recent review by PRAC in Europe revealed 330 cases of adverse liver events suspected to be linked to Flupirtine. However, no cases of liver failure or liver transplantation were reported in patients who took the medicine for two weeks or less. Based on the findings, the EMA recommends that Flupirtine should only be used to treat adults with acute pain and only if treatment with other painkillers (such as NSAIDs and weak opioids) is contraindicated. Moreover, duration of treatment with Flupirtine should not exceed two weeks and patients' liver function should be checked after each full week of treatment.

Our SentiKin Forecast: Peak Sales of $64 Million by 2021

Kindred is currently negotiating a Protocol Concurrence with the FDA for the pivotal trial for SentiKin for post-operative pain in dogs, and is planning to initiate the trial by early 2014. Management expects to receive data from the trial in late 2014 and, if positive, intends to submit a NADA in late 2014, with potential marketing approval in late 2015. Kindred is also planning to develop SentiKin for post-operative pain in horses and later on for cats. Although there is limited data available for Flupirtine in dogs, the drug certainly seems effective, and Kindred is planning to develop it for short duration use to mitigate the potential liver toxicities.

In 2011, approximately 9.7% of veterinary services provided for dogs were spay/neuter operations, while another 6.7% were categorized under other surgery, such as cancer surgery, declawing, cruciate repairs, and bone fracture repairs (Source: *US Pet Ownership & Demographics Sourcebook* 2012 edition). Given roughly 130 million dog visits to Vets annually, we estimate that this translates to roughly 21 million dogs undergoing surgery annually. Based on secondary data, we estimate that roughly 75%, or about 16 million of these dogs will receive short-term post-operative pain treatment. We forecast that SentiKin can reach the US market in 3Q16, and that Kindred on average could probably charge around $4/day for a seven-day treatment duration (i.e., roughly $30 per course of treatment). Moreover, we forecast peak market share of ~3.5% among treated dogs in 2021, corresponding to peak sales of $64 million. Based on the drug's good activity in humans, we assign a 70% probability of success, and include our risk adjusted revenues in our financial model.

Exhibit 6. Our SentiKin Forecast

SentiKin - Post-Operative Pain Management in Dogs	2016E	2017E	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E
Number of dogs undergoing an operation during a vet visit, MM	21.4	21.4	21.4	21.4	21.5	21.5	21.5	21.5	21.5	21.5
Growth rate	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%
% of dogs that actually receive short term pain treatment	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%
Number of dogs receiving Pain Rx for operation, MM	16.1	16.1	16.1	16.1	16.1	16.1	16.1	16.1	16.1	16.1
SentiKin Market Share Among Treated Dogs	0.1%	0.9%	1.9%	2.6%	3.1%	3.2%	2.7%	2.2%	1.8%	1.4%
Sequential Change	0.1%	0.8%	0.9%	0.8%	0.4%	0.1%	-0.5%	-0.5%	-0.4%	-0.3%
Number of dogs treated with SentiKin	16,063	148,660	297,468	421,087	492,439	514,023	439,023	354,615	287,056	232,983
Avg. Price (Assumes: $30 for 7 days Rx)	**$30**	**$30**	**$30**	**$31**	**$31**	**$31**	**$32**	**$32**	**$32**	**$32**
Y/Y Change		0.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
SentiKin Sales, $MM	**$2**	**$18**	**$36**	**$52**	**$61**	**$64**	**$55**	**$45**	**$37**	**$30**
Y/Y Change	NA	825%	102%	43%	18%	5%	-14%	-18%	-18%	-18%
Risk adjusted sales for SentiKin based on our 70% probability of success	**$1**	**$12**	**$25**	**$36**	**$43**	**$45**	**$39**	**$32**	**$26**	**$21**
Y/Y Change	NA	825%	102%	43%	18%	5%	-14%	-18%	-18%	-18%

Source: US Pet Ownership & Demographics Sourcebook 2012 edition, Kindred Biosciences, BMO Capital Markets Pharmaceuticals Research

Other Products: Interesting Pipeline of Biologics, but Too Early to Assess Full Value

In addition to the leading three small molecules, Kindred has a pipeline of several potentially promising biologics. KIND-502 is an anti-IgE antibody that targets the canine counterpart of the human target for Xolair, and it is being developed for allergic diseases in dogs. KIND-506 is a TNFR-Ig fusion protein that targets the canine counterpart of the human target for Enbrel, and it is being developed for inflammatory and autoimmune diseases in dogs. KIND-507 is a CTLA4-Ig fusion protein that targets the canine counterpart of the human target for Orencia, and it is being developed for autoimmune diseases in dogs. KIND-504 is a cancer vaccine for dogs; and KIND-501 is an anti-VEGF fusion protein being developed for cancer in dogs. All of these products are in early stages of development and as such we do not include product sales for any of them in our forecasts. However, we do account for them and other small molecule candidates, such as the BTK inhibitor KIND-007 in development for lymphomas, in our terminal value estimate, which accounts for roughly 36% of our DCF valuation of Kindred. (Please see Exhibit 8 for details.)

Financial Strength

Kindred is starting 2014 with cash and cash equivalents of approximately $65 million and a healthy balance sheet. With no commercial products currently being sold, we expect Kindred to continue to incur losses and generate negative cash flow in the near term. This will increase as Kindred expands its product development activities, seeks regulatory approvals, and commercializes any approved products. The healthy cash balance allows Kindred to move forward with its plans to establish a 50-person direct salesforce (complemented by distributor relationships), which should cost roughly $10 million per year to maintain. Kindred also has enough cash to cover the estimated $3-5 million R&D and $5 million product launch expenses per drug. Kindred's products are expected to reach the market in late 2015, and we forecast that the company should be cash flow positive by 2017. Overall, we believe Kindred has the financial flexibility necessary to continue its business development activities. Please see our financial models below for our detailed OPEX forecasts.

Kindred Is Led by an Experienced Management Team

Kindred is led by President and CEO Richard Chin, M.D., who is also one of the co-founders. From 2008 to 2011 Dr. Chin served as the CEO of OneWorld Health, a nonprofit engaged in the development of drugs, and from 2006 to 2008 he was the President and CEO of Oxigene, a biotechnology company. Prior to these appointments, Dr. Chin worked at Elan Pharmaceuticals (2004 to 2006) as SVP of Medical Affairs, then as SVP of Global Development, and in various positions at Genentech, Inc. (1999 to 2004). Dr. Chin is also an adjunct professor at the University of California at San Francisco and serves on the board of Galena Biopharma, Inc. and ImmunoCellular Therapeutics Ltd. We believe Dr. Chin has the knowledge and experience necessary to successfully lead Kindred.

Kevin Schultz, D.V.M, PhD. has served as the Chief Scientific Officer since July 1, 2013. He spent more than eight years at Merial, the animal health division of Sanofi, where he served as the Chief Scientific Officer and Head of R&D, and was one of the founding executives that combined the Animal Health Division of Merck with Rhone Merieux to form Merial in 1997. We believe Schultz is highly qualified and capable of leading Kindred's R&D efforts as evidenced by his work with Frontline Plus, a blockbuster flea and tick medication, and Previcox, a pain medicine for dogs. Overall, Dr. Schultz has been involved in the launch of more than 20 products for animals.

Stephen Sundlof, D.V.M., Ph.D., joined Kindred in August, 2013 as the SVP of Regulatory Affairs. Until 2010, Dr. Sundlof was the Director of the Center for Food Safety and Applied Nutrition at the FDA, a regulatory agency responsible for the safety of domestically produced and imported foods, cosmetics, drugs, biologics, medical devices and radiological products. More importantly, from 1994 to 2008, he was the Director of the Center for Veterinary Medicine at the FDA, overseeing all veterinary products regulated by the FDA including drugs given to companion animals, livestock, and other species. As a result, Dr. Sundlof has a wealth of experience with veterinary drug regulation, and we believe he was a very positive addition to the management team.

Denise Bevers is the co-founder and COO of Kindred. Ms. Bevers also co-founded SD Scientific, Inc., a medical affairs and communications company, and served as its President and CEO from 2005 to 2013. Ms. Bevers has 25 years of experience in biotech/pharma and has

managed Phase I to Phase IV development programs at Elan Pharmaceuticals, Skyepharma, and Quintiles.

Stephen Galliker, C.P.A., joined Kindred as CFO in September 2013. He serves as a director of Galena Biopharma, Inc., and Mitomics, Inc., and was a director of Osteotech Inc until 2010. Mr. Galliker served as the EVP, Finance and Administration, and CFO of Dyax Corp., a biopharmaceutical company, from 1999 to 2008. Prior to that, he was the CFO and VP, Finance and Administration at Excel Switching Corporation.

Valuation: $15/Share Using DCF as Well as P/E and Price/Sales Multiple

Kindred is a development stage company that we do not believe will be profitable until 2017, roughly two years following the probable launch of its first two products: CereKin and AtoKin. As such our primary valuation method is DCF based on our long-term forecasts for the three leading products, as well as a terminal value that also accounts for the rest of the pipeline, and of course the company's net cash position following its successful IPO on December 12, 2013. Please see Exhibit 8 below for our detailed DCF assumptions.

To support our DCF valuation, we also value Kindred on a relative basis by using the average of a range of both P/E and price/sales multiples. Relative valuation of Kindred is very difficult, in our view, given the low number and diversity of comparable Animal Health companies. Nonetheless, as illustrated below, we forecast that, between 2017 and 2020, Kindred will experience rapid growth following the probable launch of its leadings products. Overall, we forecast revenues/share to grow by a CAGR of 23%, while EPS grows by a CAGR of 34%. Applying an average PE multiple in the range of 15-19 to our 2017-2021, and discounting back accordingly, we arrive at a valuation of $16/share. We believe the above P/E multiple range is conservative given Kindred's growth prospects during that period. Similarly, applying an average price/sales multiple 3-5x our 2017-2021 revenues/share forecasts, and discounting back accordingly, we arrive at a valuation of $14/share. This could also prove conservative because we believe there is a good chance that Kindred will likely be acquired by one of the larger animal health companies (e.g. Zoetis, Eli Lilly) at 7-8x sales. The average of these two relative valuations is in line with our $15/share DCF valuation. Please see exhibits below for details.

Exhibit 7. Relative Valuation of Kindred is Very Challenging, In Our View, Given the Low Number and Diversity of Comparable Animal Health Companies

Company	Ticker	MCAP (MM)	EV (MM)]	P/E FY1	EV/ EBITDA FY1	P/Sales	P/Sales FY1
Zoetis	**ZTS**	$16,180	$19,466	23	15.55	3.61	3.46
Virbac SA	**VIRP**	€ 1,364	€ 1,632	23	12.39	1.89	1.85
				Aratana estimates based on 2017 or 2018 figures			
Aratana	**PETX**	$455	$407	N/A			3.31

Source: Bloomberg, BMO Capital Markets Pharmaceuticals Research

Exhibit 8. We Value Kindred Biosciences at $15/Share Based on Both DCF as well as P/E and Price/Sales Multiple

DCF Valuation, $000		Q4 2013E	2014E	2015E	2016E	2017E	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	>2025E
Cash flow from operations		-1,343	-10,087	-17,717	-4,025	18,126	30,215	39,373	42,285	28,892	25,128	22,599	20,060	18,015	18,376
Y/Y Growth				NM	NM	NM	67%	30%	7%	-32%	-13%	-10%	-11%	-10%	2%
CAPEX		-2	-12	-12	-13	-13	-14	-15	-18	-22	-23	-23	-25	-26	-26
Interest Expense (1-t)		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Free Cash Flow to the Firm (FCFF)		-1,344	-10,098	-17,729	-4,038	18,113	30,201	39,357	42,266	28,870	25,105	22,576	20,035	17,989	18,350
Y/Y Growth				NM	NM	NM	67%	30%	7%	-32%	-13%	-10%	-11%	-10%	2%
Discount Period		0	1	2	3	4	5	6	7	8	9	10	11	12	
Discount Rate	**9%**														
Discounted FCFF		-1,344	-9,265	-14,922	-3,118	12,832	19,629	23,468	23,121	14,489	11,559	9,536	7,764	6,396	

	Total, $000s	**Per share**
PV of FCFF (2013-2025)	100,144	
Terminal Value at 2025	262,140	
PV of Terminal Value	93,200	
Cash & Equivalents, pre-IPO	10,992	
Total Debt	0	
Total Stockholders' Equity Value; Pre-IPO Capital	**204,336**	
Shares Issued at IPO	8,625	$7.00
Net Proceeds from IPO	$55,097	$3.19
Diluted shares Post IPO, 000s	17,273	
Total Stockholders' Equity Value, Post IPO	**$259,433**	**$15**

BMO Comments:

Although we use a relatively low discount rate for a development stage company, our revenue and OPEX forecasts are risk adjusted based on our expected probability of success for each program.

Terminal growth rate assumption is 2% based on 1) relatively low generic competition and brand loyalty, 2) effectiveness of lifecycle management tactics in this market.

TV is roughly 36% of our valuation and accounts for the 7 other candidates such as the biologics in the pipeline.

$55.1M raised at IPO (8.625MM shares at $7/share, adjusted for underwriting charges & other expenses)

PE Multiple Valuation Using Non-GAAP EPS

		2017E	2018E	2019E	2020E	2021E
	EPS	**$0.93**	**$1.58**	**$2.07**	**$2.21**	**$1.43**
PEx	**15**	$10	$15	$18	$18	$11
	16	$10	$16	$20	$19	$11
	17	$11	$17	$21	$21	$12
	18	$12	$18	$22	$22	$13
	19	$12	$20	$23	$23	$14
Discount Period		4	5	6	7	8
Average	**$16**		**Min**	**$10**	**Max**	**$23**
Discount rate	9%					

2017-20 EPS CAGR
33.6%

Revenues per Share Multiple Valuation (i.e. Take out valuation)

		2017E	2018E	2019E	2020E	2021E
	Sales per share	**$3.83**	**$5.50**	**$6.58**	**$7.07**	**$6.68**
Multiple	**3.0**	$8	$11	$12	$12	$10
	3.5	$9	$13	$14	$14	$12
	4.0	$11	$14	$16	$15	$13
	4.5	$12	$16	$18	$17	$15
	5.0	$14	$18	$20	$19	$17
Discount Period		4	5	6	7	8
Average	**$14**		**Min**	**$8**	**Max**	**$20**
Discount rate	9%					

2017-20 CAGR
22.7%

Source: Kindred Biosciences Form S-1, BMO Capital Markets Pharmaceuticals Research

Key Investment Risks:

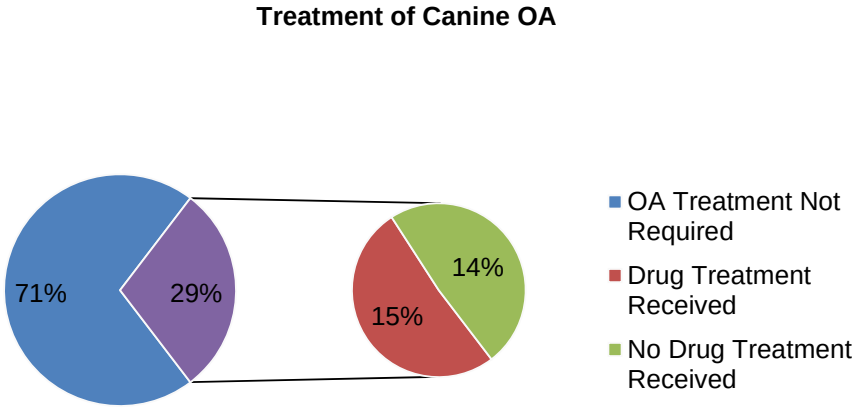
- **Success of the leading phase-3 programs is uncertain.** All programs are speculative and have relatively modest supporting data in dogs. Most of the supporting evidence comes from human data.
- **Regulatory approval of the products remains uncertain in both the US and other major markets.**
- **Commercial success: All leading products would be entering highly competitive markets with cheap generics.** Currently, only 6% of dog owners have pet insurance; however, the purchase of pet insurance is expected to increase more than 11% annually through 2016. As more owners get pet insurance, there will be increased focus on cost containment. Therefore, the performance of the products could be below our expectation.

Appendix and Backup Exhibits:

We conducted two surveys, each with about 30 veterinarians, focusing on Kindred's leading products, CereKin and AtoKin. Below is a summary of the results for both these surveys.

Our CereKin OA Survey Results:

Exhibit 9. Roughly, 25-29% Dogs Seen By Vets That Require OA Treatment (Average 29%, Median 25%), but Only Half Receive Drug Therapy (Average 49%, Median 50%)

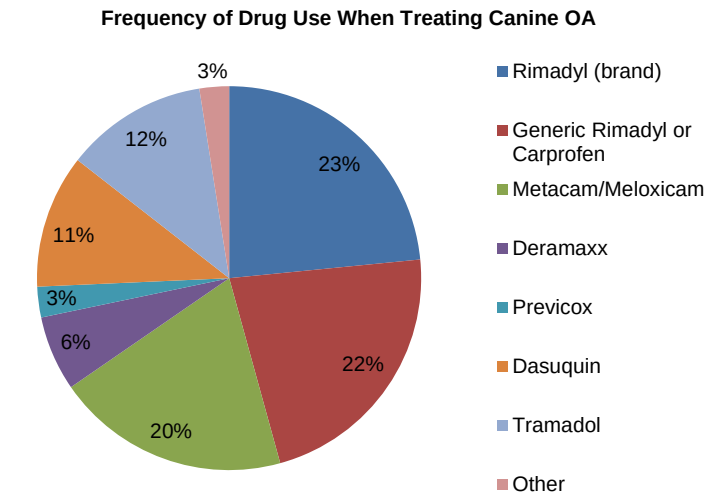


Question: Roughly, what percent of the dogs you see in your practice have osteoarthritis that you believe needs to be treated?

Question: Roughly, what percentage of these dogs with osteoarthritis do you treat with a prescription medication where, as far as you know, the drug is purchased?

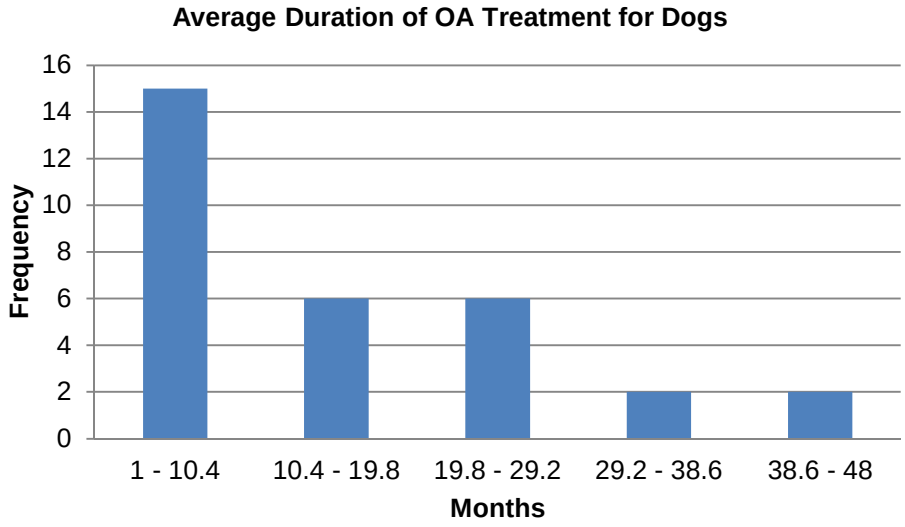
Source: BMO Capital Markets Pharmaceuticals Proprietary Veterinarian Survey.

Exhibit 10. Rimadyl (Average 23%, Median 10%), Generic Rimadyl/Carprofen (Average 22%, Median 10%), or Metacam/Meloxicam (Average 20%, Median 10%) are Prescribed Most Often by Vets for Dogs with OA



Question: In cases where you do treat a dog with osteoarthritis, how often do you use the following drugs? Please assign an approximate percent figure to each category.
Source: BMO Capital Markets Pharmaceuticals Proprietary Veterinarian Survey.

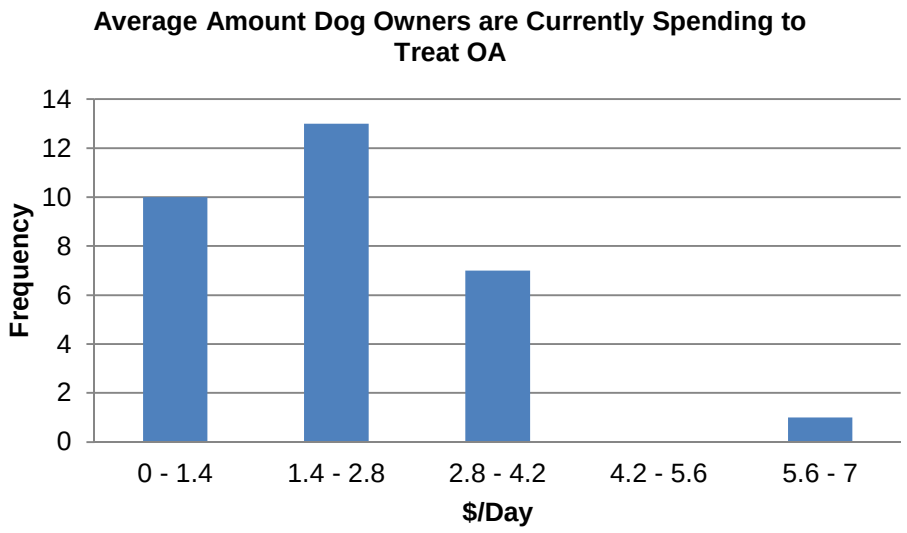
Exhibit 11. According to Vets, Most Dogs Receive OA Treatment for Approximately One Year (Average 14 months, Median 12 months)



Question: What is the average duration of prescription therapy in dogs with osteoarthritis?

Source: BMO Capital Markets Pharmaceuticals Proprietary Veterinarian Survey.

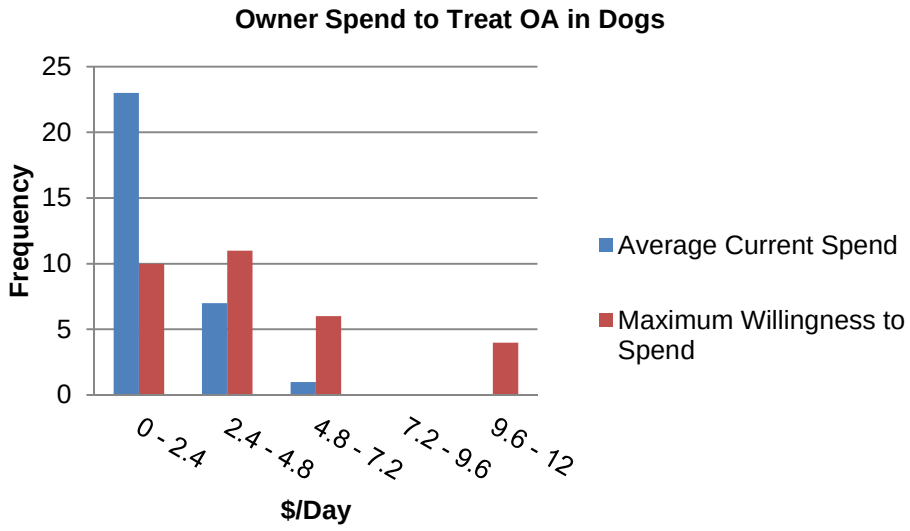
Exhibit 12. According to Vets, Dog Owners Currently Spend $2/Day (Average and Median) to Treat OA in Their Pets



Question: Based on your practice, what is the AVERAGE amount per day a dog owner is CURRENTLY spending to treat osteoarthritis in their pet?

Source: BMO Capital Markets Pharmaceuticals Proprietary Veterinarian Survey.

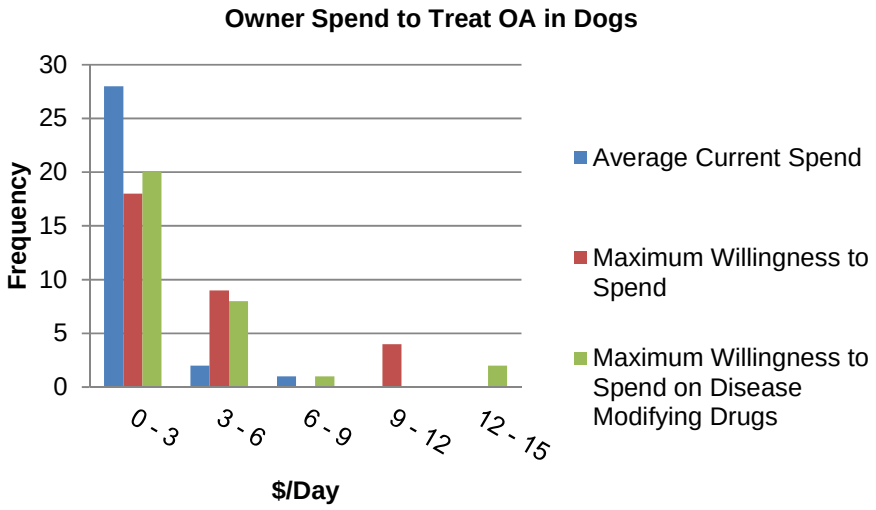
Exhibit 13. According to Vets, Dog Owners Are Willing to Spend More to Treat OA in Their Pets (Average $4/Day, Median $3/Day)



Question: Based on your practice, what is the MAXIMUM total amount per day you think an average dog owner would realistically be willing to pay to treat osteoarthritis in their pet?

Source: BMO Capital Markets Pharmaceuticals Proprietary Veterinarian Survey.

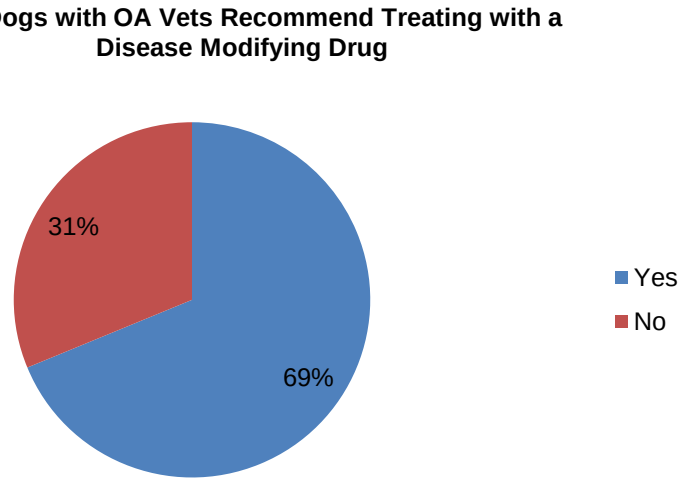
Exhibit 14. According to Vets, Dog Owners Are Willing to Spend More on Disease Modifying Drugs to Treat OA in Their Pets (Average $4/Day, Median $3/Day)



Question: If a new product was able to claim that it moderately modifies the course of osteoarthritis (OA) in dogs, what is the maximum amount you think the average dog owner in your practice would be willing to pay for that drug?

Source: BMO Capital Markets Pharmaceuticals Proprietary Veterinarian Survey.

Exhibit 15. If They Had the Choice, Vets Would Recommend Treating the Majority of Dogs with Disease Modifying Drugs for OA (Average 69%, Median 67%)



Question: In what proportion of dogs with osteoarthritis, would you recommend using a drug that claims it can moderately modify the course of osteoarthritis? (Assuming you can use the drug either on its own or in combination with a symptom managing drug like an NSAID and that the owner could afford the new drug).

Source: BMO Capital Markets Pharmaceuticals Proprietary Veterinarian Survey.

Exhibit 16. Selective List of Most Important Factors When Choosing a Drug for the Treatment of OA in Dogs (Veterinarian verbatim)

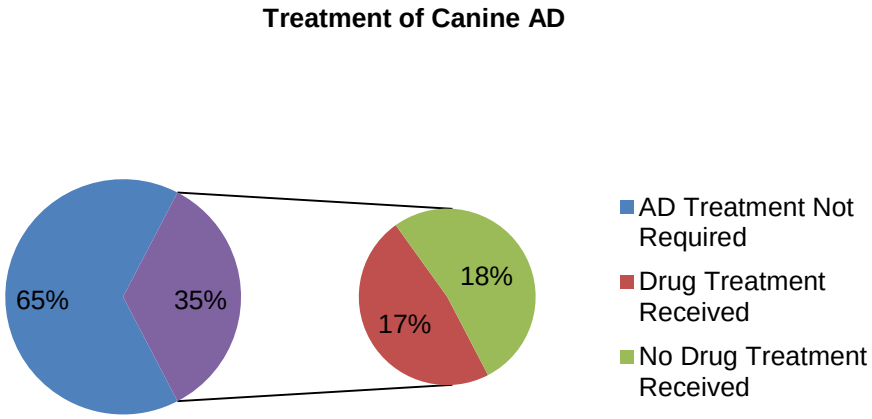
Question: Please provide your rationale for choosing a particular drug for the treatment of osteoarthritis in dogs? What are the most important factors in your decision? Feel free to include other comments related to the questions in this survey. Thank you!

First - overall health of the dog - are there any other conditions: liver, GI, renal disease or neoplasia; Second - How badly affected is the dog? Can we modify the life style; Lose weight; etc Third - How big is the dog / how old is the dog and what type of financial resources do the owners have. If it is over 80 lbs and the owners have no financial limitations and the dog has no other conditions then NSAIDS **. If the owners have financial limitations - tramadol + or - gabapentin.**
How painful is the animal? What can the owner afford? What is likely to work the best? Is there any evidence of any internal organ dysfunction? Is the dog painful enough that it needs something in addition to an NSAID?
Safety is always the number one factor - do no harm. The second factor is efficacy and the third factor is cost. But the client can always make cost the number one factor - sometimes the only factor.
Blood work to make sure there is no underlying renal or hepatic issues. No stomach issues
Most of my choice is made by efficacy with fewest side effects. In addition, I usually recommend life style changes and supplements to help reduce the long-term consequences of OA.
When I treat OA, I attempt to provide multi-modal therapy whenever possible. If the patient is otherwise healthy, this might include an NSAID, an analgesic (e.g., tramadol), and supplements including glucosamine and fish oil. I also prescribe weight loss and physical activity in most cases since obesity contributes significantly to a sedentary lifestyle and symptoms of arthritis pain.
I rec drugs based on age of the dog, severity of signs, and radiographic evidence. I will also try to get dog on **least side effect drug possible**. I may start with a combo of drugs and reduce to few as possible to get resolution of signs. I will strongly push for weight loss as well. E.g., I'll usually start on dasoquin and deramax then try to wean off deramax if possible. For dogs that are still painful I will add tramadol for a short period of time.
I use a combination modality in treating OA - nSAIDS, nutraceuticals, diet and soon laser thx. Early in the disease I may only use a nutraceutical such as Dasuquin and/or diet and hopefully reserve the nSAID for later in the disease if at all possible. I will also add tramadol if they are sensitive to nSAIDS and also gabapentin is helpful.
Carprofen is the most readily available product at my clinic; it is the only NSAID that we carry. It has a wide safety margin, and the majority of pet on it are provided quite effective and immediate pain relief. It is also affordable to the clinic and the owner.
Effectiveness at improving clinical signs. Cost. Convenience. Palatability. Comorbidities like renal or hepatic disease.
Efficacy, clinical effect and ideally, supportive research.
The most important factors are (1)safety, (2)efficacy, (3)cost. Even things like fish oil and joint supplements have a place because they are safe/cheap and in some cases effective. If there was a new treatment option it would have to balance these 3 primary factors.
Effectiveness, ease of administration, lack of side effects/complications
cost is often number one factor.
I take into consideration the efficacy of the drug, the side effects and ease of administration. When determining the medications to choose for a case the extent of the arthritis, compliance and cooperation of the owner and patient are important,
I believe some NSAIDS work better in one dog, some work better in another. I usually choose Carprofen for larger dogs (over 12.5 pounds), metacam for smaller dogs, sometimes **Meloxican for giant dogs because they can use the human generic form which is much more cost effective**. I am a fan of Adequan, one of the only proven treatments for OA.

Source: BMO Capital Markets Pharmaceuticals Proprietary Veterinarian Survey.

Our AtoKin AD Survey Results:

Exhibit 17. Percent of Dogs Seen by Vets that Require AD Treatment (Average 35%, Median 25%), Half of Which End Up Not Being Treated With a Drug (Average 52%, Median 50%)

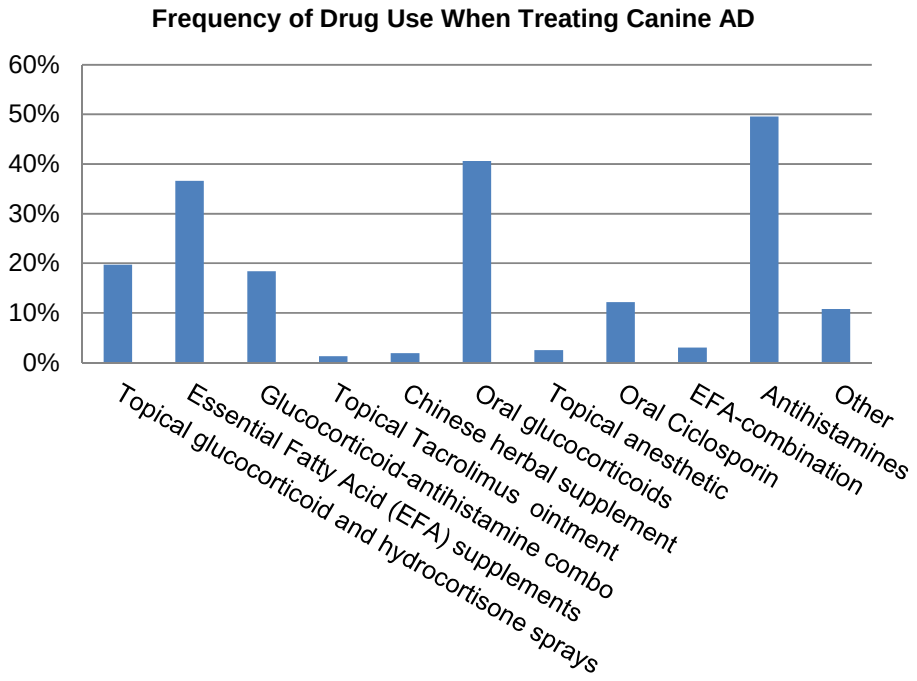


Question: Roughly, what percent of the dogs you see in your practice have atopic dermatitis that you believe needs to be treated with a prescription drug or other medicine?

Question: Roughly, what percentage of these dogs with atopic dermatitis do you actually treat with a drug (prescription or other) where, as far as you know, the drug is purchased by the owner?

Source: BMO Capital Markets Pharmaceuticals Proprietary Veterinarian Survey.

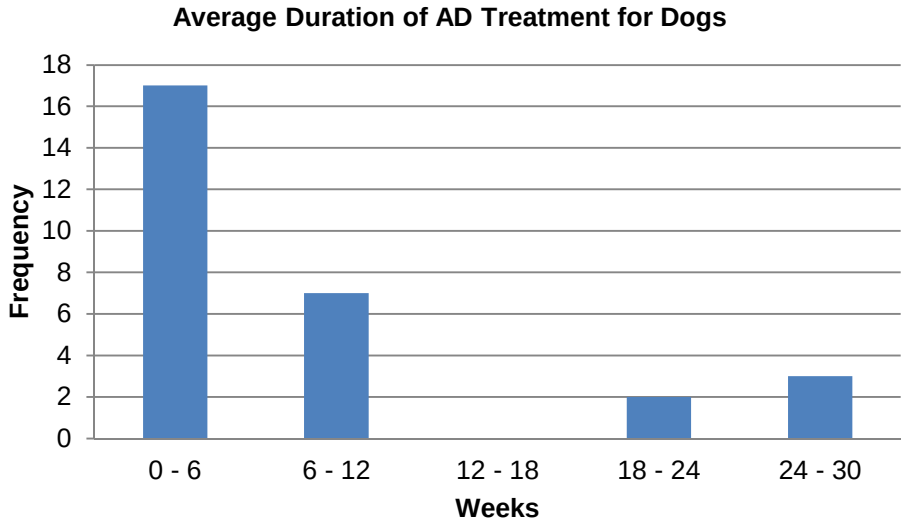
Exhibit 18. When Treating AD, Vets Often Prescribe Antihistamines (Average 49%, Median 50%) and Oral Glucocorticoids (Average 42%, Median 49%) Most Often



Question: In cases where you do treat a dog with atopic dermatitis with a medication, how often do you use the following drugs? We appreciate that treatment is multi-faceted and you often use these in combination or in sequence, but in general, please tell us roughly in what proportion of dogs with atopic dermatitis you use the following products. Given combination and sequential treatment, the sum does not have to add to 100%.

Source: BMO Capital Markets Pharmaceuticals Proprietary Veterinarian Survey.

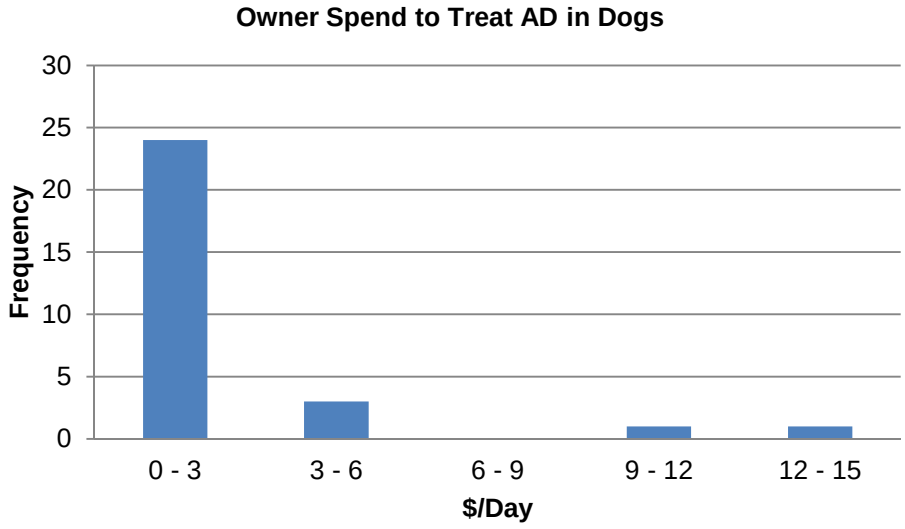
Exhibit 19. Most Dogs Receive AD Treatment for Less Than 10 Weeks (Average 9 weeks, Median 4 weeks)



Question: Although we realize that you tailor the frequency and duration of treatment to the severity of clinical signs (i.e., acute flares or chronic), on average, what is the duration of treatment for atopic dermatitis with a particular drug?

Source: BMO Capital Markets Pharmaceuticals Proprietary Veterinarian Survey.

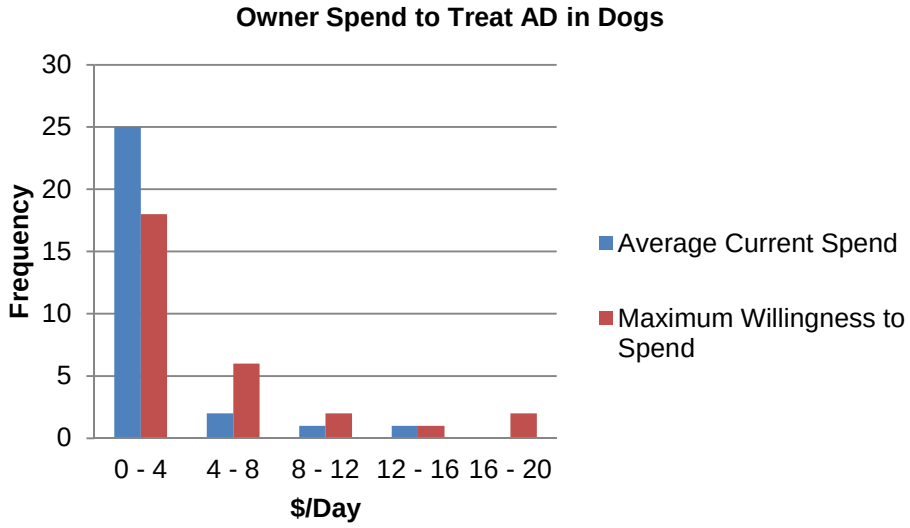
Exhibit 20. According to Vets, Dog Owners Currently Spend an Average of $3/Day (Median $2/Day) to Treat AD in Their Pets



Question: Based on your practice, what is the average amount per day a dog owner is currently spending to treat atopic dermatitis (AD) in their pet?

Source: BMO Capital Markets Pharmaceuticals Proprietary Veterinarian Survey.

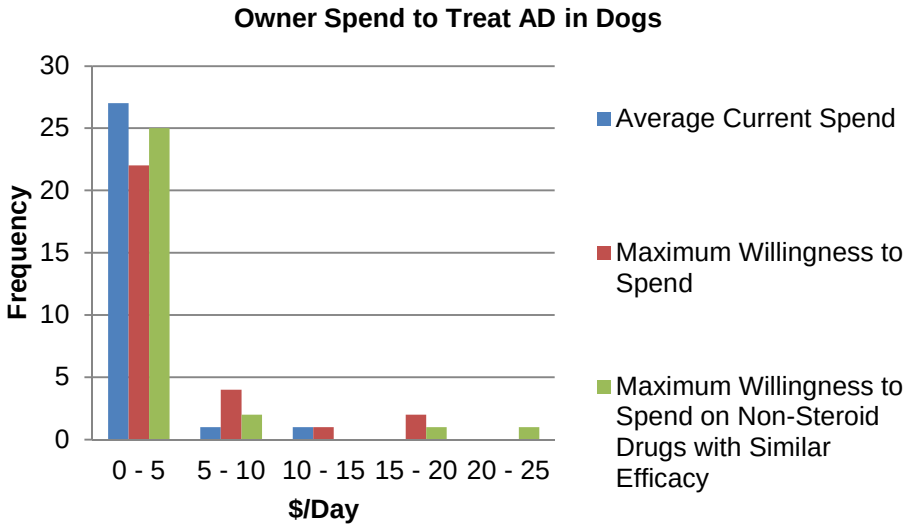
Exhibit 21. According to Vets, Dog Owners Are Willing to Spend More to Treat AD in Their Pets (Average $5/Day, Median $4/Day)



Question: Based on your practice, what is the MAXIMUM total amount per day you think an average dog owner would realistically be willing to pay to treat atopic dermatitis (AD) in their pet?

Source: BMO Capital Markets Pharmaceuticals Proprietary Veterinarian Survey.

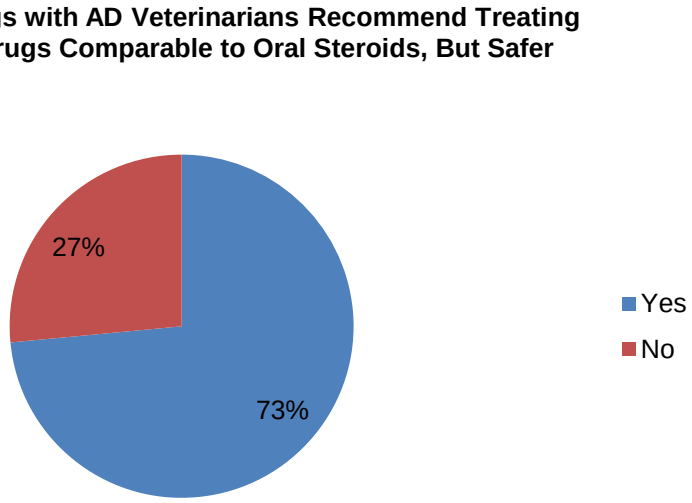
Exhibit 22. According to Vets, Dog Owners Would be Willing to Spend More for a Drug That Is Comparable to an Oral Glucocorticoid but Safer (Average $4/day, Median $3/day) Than They Currently Spend



Question: If a new oral product for atopic dermatitis in dogs was able to claim that it has comparable or better efficacy vs. an oral glucocorticoid or corticosteroid (specifically, methylprednisolone) but a better safety profile, what is the maximum amount you think the average dog owner in your practice would be willing to pay for that drug?

Source: BMO Capital Markets Pharmaceuticals Proprietary Veterinarian Survey.

Exhibit 23. Veterinarians Would Recommend Using a Drug that Has Comparable Efficacy to Oral Glucocorticoids but Safer (Average 73%, Median 85%)



Question: In what proportion of dogs with atopic dermatitis (AD) would you recommend using a drug that claims it has comparable or better efficacy vs. an oral glucocorticoid or corticosteroid (specifically, methylprednisolone) and a better safety profile ? (Assuming owners would be willing to pay for the product)

Source: BMO Capital Markets Pharmaceuticals Proprietary Veterinarian Survey.

Exhibit 24. Selective List of Most Important Factors When Choosing a Drug for the Treatment of AD in Dogs (Veterinarian verbatim)

Question: Please provide your rationale for choosing a particular drug for the treatment of atopic dermatitis in dogs. What are the most important factors in your decision? Feel free to include other comments related to the questions in this survey. Thank you!

I would love to find a safer drug than steroids for atopic dermatitis. Nothing on the market is as efficacuious [*sic*] as steroids[.]
Safety, safety and safety, if the owners will spring for the cost.
Price, efficacy, safety
Usually cost is the deciding factor.
Hepatic or renal toxicity- or other long term treatments.
Looking for onset of effectiveness, not delayed response; low dosing frequency like once daily; taste acceptance and minimal side effects.
Does it work, how quickly does it work, side effects both short and long term, does it have a proven track record, cost, owner compliance [i.e.] bid vs tid vs qid
I would like to prescribe the safest drug but the owner must be able to afford it
[E]fficacy, safety, frequency of administration, ease of administration
[I] always recommend allergy testing to get to the cause of atopy... [A]topica is my drug of choice...**steroids are reserved for clients that don't want to spend the money**...but enable me to give temporary relief to the dog[.]
Effectiveness[,] Ease of administration[,] Side effects[,] Concurrent medications[,] Concurrent diseases[,] Cost
The most important is making sure the dog is comfortable and any secondary yeast or bacterial infections are dealt with, **so I usually start with prednisone to get them comfortable more quickly**. If the dog is large, [A]topica is basically cost prohibitive.
I try to pick the drug that has a combination of low cost and efficacy and safety. It is an art to pick the drug that fits all of these criteria best in a given pet. There is so much variation in the severity of symptoms and in the willingness of the owner to spend money that there is no single answer. **There is no perfect drug at this point in time**.
Clinical response, safety, lack of adverse side effects[.]
I try to use steroids as little as possible, because of the side effects. I like cyclosporine . . . but it is costly and I find clients often don't stay with it. I'm not a big fan of topical treatments, if it can be avoided (or just use raw aloe from the plant).
Chronic therapy most common, steroid side effects are the chief concern. I see best results with temaril [*sic*] combined with adjuvants[.]
Combination of factors, based off owners [*sic*] willingness for compliance, severity of puritis [*sic*], and duration of signs. If mild signs with intermittent flare ups [*sic*], much more likely to go to corticosteriods [*sic*] vs atopica [*sic*]. If long standing problems, owner wants a solution and they are willing to pay for the cyclosporine often I feel that is the better choice for the particular pet in question. First line [*sic*] is usually antihistamines/topical that if there is true AD are unlikely to work but I feel they are safest/easiest/cheapest first line [*sic*] in therapy.
Efficacy - glucocorticoids are very effective and quick to work; antihistamines hardly ever work[.] Onset of action - glucocorticoids work quickly. Cyclosporine does not. Immunotherapy is treatment for "next season" and only works about 70% of the time[.] **Cost - glucocorticoids are inexpensive. The other modalities are expensive[.]** **Side effects - unfortunately, glucocorticoids have many side effects, but so does cyclosporine[.]**

Source: BMO Capital Markets Pharmaceuticals Proprietary Veterinarian Survey.

Exhibit 25. Canine Brief Inventory (CBPI) Survey

Today's Date: ☐☐ / ☐☐ / ☐☐
Month Day Year

Patient/Study ID# _____

Canine Brief Pain Inventory (CBPI)

Description of Pain:

Rate your dog's pain.

1. Fill in the oval next to the one number that best describes the pain at its **worst** in the last 7 days.

○ 0	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6	○ 7	○ 8	○ 9	○ 10
No Pain										Extreme Pain

2. Fill in the oval next to the one number that best describes the pain at its **least** in the last 7 days.

○ 0	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6	○ 7	○ 8	○ 9	○ 10
No Pain										Extreme Pain

3. Fill in the oval next to the one number that best describes the pain at its **average** in the last 7 days.

○ 0	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6	○ 7	○ 8	○ 9	○ 10
No Pain										Extreme Pain

4. Fill in the oval next to the one number that best describes the pain as it is **right now**.

○ 0	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6	○ 7	○ 8	○ 9	○ 10
No Pain										Extreme Pain

Description of Function:

Fill in the oval next to the **one number** that describes how during the past 7 days **pain has interfered** with your dog's:

5. General Activity

○ 0	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6	○ 7	○ 8	○ 9	○ 10
Does not Interfere										Completely Interferes

6. Enjoyment of Life

○ 0	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6	○ 7	○ 8	○ 9	○ 10
Does not Interfere										Completely Interferes

Patient/Study ID# _____

Description of Function (continued):

Fill in the oval next to the one number that describes how during the past 7 days **pain has interfered** with your dog's:

7. Ability to Rise to Standing From Lying Down

○ 0	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6	○ 7	○ 8	○ 9	○ 10
Does not Interfere										Completely Interferes

8. Ability to Walk

○ 0	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6	○ 7	○ 8	○ 9	○ 10
Does not Interfere										Completely Interferes

9. Ability to Run

○ 0	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6	○ 7	○ 8	○ 9	○ 10
Does not Interfere										Completely Interferes

10. Ability to Climb Up (for example Stairs or Curbs)

○ 0	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6	○ 7	○ 8	○ 9	○ 10
Does not Interfere										Completely Interferes

Overall Impression:

11. Fill in the oval next to the one response best describes your dog's overall quality of life over **the last 7 days**?

○ Poor ○ Fair ○ Good ○ Very Good ○ Excellent

Source: University of PA (2006).

Kindred Biosciences Income Statement: Our GAAP Near-Term Forecasts

		2013E					2014E					
GAAP Income Statement, $000	**2012A**	**Q1 2013**	**Q2 2013**	**Q3 2013**	**Q4 2013**	**2013E**	**Q1 2014**	**Q2 2014**	**Q3 2014**	**Q4 2014**	**2014E**	**2015E**
Revenues	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4,579**
Cost of Sales	0	0	0	0	0	0	0	0	0	0	0	2,131
Gross Profit	0	0	0	0	0	0	0	0	0	0	0	2,448
Research and development	75	220	220	954	1,451	2,846	2,215	2,728	2,719	2,716	10,378	9,867
General and administrative	45	89	89	259	272	710	277	283	288	294	1,142	13,437
Earnings from operations	-120	-310	-310	-1,213	-1,724	-3,556	-2,492	-3,011	-3,007	-3,010	-11,520	-20,856
Other (Income) / Deductions - Net	-0	0	0	-3	-9	-12	-55	-54	-51	-49	-209	-165
Income From Continuing Operations Before Provision for Taxes on Income	-120	-310	-310	-1,210	-1,714	-3,544	-2,437	-2,957	-2,956	-2,961	-11,311	-20,691
(Benefit) / Provision for Taxes on Income	0	0	0	0	0	0	0	0	0	0	0	0
Net Income/ (loss)	**($120)**	**($310)**	**($310)**	**($1,210)**	**($1,714)**	**($3,544)**	**($2,437)**	**($2,957)**	**($2,956)**	**($2,961)**	**($11,311)**	**($20,691)**
Earnings Per Share - Basic	($0.06)	($0.10)	($0.10)	($0.40)	($0.23)	($0.86)	($0.15)	($0.18)	($0.18)	($0.18)	($0.70)	($1.25)
Earnings Per Share - Diluted	**($0.06)**	**($0.10)**	**($0.10)**	**($0.40)**	**($0.22)**	**($0.85)**	**($0.14)**	**($0.17)**	**($0.17)**	**($0.17)**	**($0.65)**	**($1.18)**
Weighted-Average Shares - Basic	2,113	3,000	3,000	3,001	7,399	4,100	16,173	16,236	16,298	16,358	16,266	16,499
Weighted-Average Shares - Diluted	2,113	3,000	3,000	3,001	7,766	4,192	17,273	17,336	17,398	17,458	17,366	17,599
Dividend per Share	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**

	2012A	**Q1 2013**	**Q2 2013**	**Q3 2013**	**Q4 2013**	**2013E**	**Q1 2014**	**Q2 2014**	**Q3 2014**	**Q4 2014**	**2014E**	**2015E**
Growth Rates (YOY)												
Revenues	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Gross Profit	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Operating Income (EBIT)	NA	NA	NA	NA	1341%	2872%	705%	872%	148%	75%	224%	81%
Net Income	NA	NA	NA	NA	1333%	2863%	687%	855%	144%	73%	219%	83%
EPS- Diluted	NA	NA	NA	NA	290%	1393%	37%	65%	-58%	-23%	-23%	81%
Margins												
Gross Profit	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	53%
Operating Profit	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-456%
Net Income	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-452%

Source: Kindred Bioscienses SEC Filings, BMO Capital Markets Pharmaceuticals Research

Kindred Biosciences Income Statement: Our GAAP Longer-Term Forecasts

GAAP Income Statement, $000	2012A	2013E	2014E	2015E	2016E	2017E	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E
Revenues	**0**	**0**	**0**	**4,579**	**32,031**	**68,823**	**99,842**	**120,432**	**130,246**	**123,813**	**109,011**	**94,946**	**83,646**	**74,595**
Cost of Sales	0	0	0	2,131	11,211	24,088	34,945	42,151	45,586	43,335	38,154	33,231	29,276	26,108
Gross Profit	0	0	0	2,448	20,820	44,735	64,897	78,281	84,660	80,479	70,857	61,715	54,370	48,487
Research and development	75	2,846	10,378	9,867	10,016	10,167	10,322	10,482	10,646	14,858	11,991	9,495	8,365	7,460
General and administrative	45	710	1,142	13,437	17,040	18,046	18,918	19,649	20,228	28,477	26,163	22,787	20,075	17,903
Earnings from operations	-120	-3,556	-11,520	-20,856	-6,235	16,523	35,657	48,150	53,786	37,144	32,703	29,433	25,930	23,125
Other (Income) / Deductions - Net	-0	-12	-209	-165	-116	-130	-210	-327	-467	-595	-689	-772	-845	-911
Income From Continuing Operations Before Provision for Taxes on Income	-120	-3,544	-11,311	-20,691	-6,119	16,653	35,868	48,476	54,253	37,739	33,392	30,205	26,776	24,036
(Benefit) / Provision for Taxes on Income	0	0	0	0	0	0	7,174	10,665	13,563	11,322	10,018	9,061	8,033	7,211
Net Income/ (loss)	**($120)**	**($3,544)**	**($11,311)**	**($20,691)**	**($6,119)**	**$16,653**	**$28,694**	**$37,812**	**$40,690**	**$26,418**	**$23,375**	**$21,143**	**$18,743**	**$16,825**
Earnings Per Share - Basic	($0.06)	($0.86)	($0.70)	($1.25)	($0.37)	$0.99	$1.68	$2.20	$2.35	$1.52	$1.33	$1.20	$1.06	$0.95
Earnings Per Share - Diluted	**($0.06)**	**($0.85)**	**($0.65)**	**($1.18)**	**($0.34)**	**$0.93**	**$1.58**	**$2.07**	**$2.21**	**$1.43**	**$1.25**	**$1.13**	**$1.00**	**$0.89**
Weighted-Average Shares - Basic	2,113	4,100	16,266	16,499	16,705	16,887	17,048	17,191	17,317	17,429	17,528	17,616	17,694	17,763
Weighted-Average Shares - Diluted	2,113	4,192	17,366	17,599	17,805	17,987	18,148	18,291	18,417	18,529	18,628	18,716	18,794	18,863
Dividend per Share	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**

	2012A	2013E	2014E	2015E	2016E	2017E	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E
Growth Rates (YOY)														
Revenues	NA	NA	NA	NA	600%	115%	45%	21%	8%	-5%	-12%	-13%	-12%	-11%
Gross Profit	NA	NA	NA	NA	751%	115%	45%	21%	8%	-5%	-12%	-13%	-12%	-11%
Operating Income (EBIT)	NA	2872%	224%	81%	-70%	-365%	116%	35%	12%	-31%	-12%	-10%	-12%	-11%
Net Income	NA	2863%	219%	83%	-70%	-372%	72%	32%	8%	-35%	-12%	-10%	-11%	-10%
EPS- Diluted	NA	1393%	-23%	81%	-71%	-369%	71%	31%	7%	-35%	-12%	-10%	-12%	-11%
Margins														
Gross Profit	NA	NA	NA	53%	65%	65%	65%	65%	65%	65%	65%	65%	65%	65%
Operating Profit	NA	NA	NA	-456%	-19%	24%	36%	40%	41%	30%	30%	31%	31%	31%
Net Income	NA	NA	NA	-452%	-19%	24%	29%	31%	31%	21%	21%	22%	22%	23%

Source: Kindred Bioscienses SEC Filings, BMO Capital Markets Pharmaceuticals Research

Kindred Biosciences Balance Sheet

Kindred Balance Sheet, $000	2012A	2013E	2014E	2015E	2016E	2017E	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E
Assets														
Cash and cash equivalents	938	64,753	54,654	36,925	32,887	51,001	81,202	120,559	162,826	191,696	216,800	239,376	259,411	277,401
Prepaid expenses and other	1	468	818	1,850	1,949	2,033	2,108	2,173	2,228	2,816	2,437	2,071	1,832	1,642
Total current assets	938	65,221	55,472	38,775	34,836	53,034	83,310	122,732	165,053	194,512	219,237	241,447	261,244	279,043
Property and equipment, net	0	13	21	27	32	33	34	36	38	42	45	48	54	58
Total Assets	**938**	**65,234**	**55,493**	**38,802**	**34,868**	**53,067**	**83,344**	**122,769**	**165,091**	**194,554**	**219,282**	**241,495**	**261,298**	**279,101**
Liabilities and Equity														
Accounts payable	5	187	327	740	779	813	843	869	891	1,126	975	828	733	657
Due to related party	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Accrued expenses	60	748	766	2,023	2,139	2,241	2,333	2,413	2,480	3,123	2,720	2,322	2,055	1,842
Total current liabilities	70	940	1,098	2,768	2,923	3,059	3,180	3,287	3,376	4,254	3,700	3,155	2,793	2,503
Preferred Stock	**987**													
Total Equity	**-119**	**64,294**	**54,395**	**36,035**	**31,944**	**50,008**	**80,164**	**119,482**	**161,716**	**190,300**	**215,582**	**238,340**	**258,505**	**276,598**
Total liabilities and equity	938	65,234	55,493	38,802	34,868	53,067	83,344	122,769	165,091	194,554	219,282	241,495	261,298	279,101

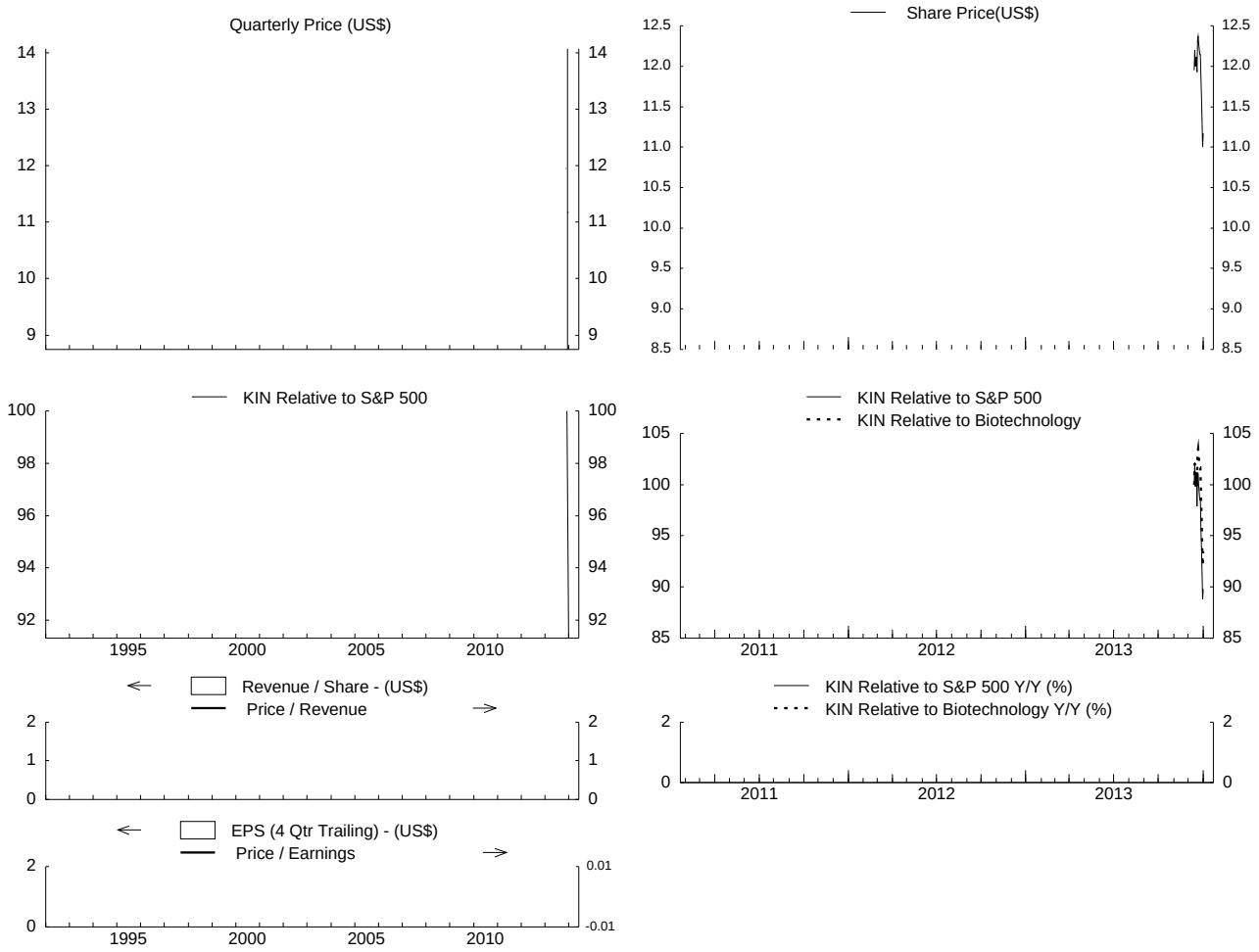
Source: Kindred Biosciences Form S-1, BMO Capital Markets Pharmaceuticals Research

Kindred Biosciences Statement of Cash Flow

Kindred Statement of Cash Flows, $000	2012A	2013E	2014E	2015E	2016E	2017E	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E
Operating activities														
Net income/(loss)	-120	-3,544	-11,311	-20,691	-6,119	16,653	28,694	37,812	40,690	26,418	23,375	21,143	18,743	16,825
Adjustments:														
Stock-based compensation expense	11	848	1,152	2,330	2,029	1,411	1,462	1,507	1,544	2,167	1,908	1,614	1,422	1,268
Depreciation expense	0	2	4	6	9	12	13	14	16	18	20	20	19	22
Changes in operating assets and liabilities														
Net cash provided by operating activities	**-63**	**-2,374**	**-10,087**	**-17,717**	**-4,025**	**18,126**	**30,215**	**39,373**	**42,285**	**28,892**	**25,128**	**22,599**	**20,060**	**18,015**
Investing Activities														
Purchase of property and equipment	0	-15	-12	-12	-13	-13	-14	-15	-18	-22	-23	-23	-25	-26
Net cash used in investing activities	**0**	**-15**	**-12**	**-12**	**-13**	**-13**	**-14**	**-15**	**-18**	**-22**	**-23**	**-23**	**-25**	**-26**
Financing activities														
Proceeds from preferred stock issuance	990	11,097	0	0	0	0	0	0	0	0	0	0	0	0
Proceeds from note payable to related party	10	0	0	0	0	0	0	0	0	0	0	0	0	0
Exercise of stock options	0	11	0	0	0	0	0	0	0	0	0	0	0	0
Proceeds from sale of common stock	0	55,097	0	0	0	0	0	0	0	0	0	0	0	0
Net cash provided by/(used in) financing activities	**1,000**	**66,205**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Net increase/(decrease) in cash and cash equivalents	**938**	**63,815**	**-10,098**	**-17,729**	**-4,038**	**18,113**	**30,201**	**39,357**	**42,266**	**28,870**	**25,105**	**22,576**	**20,035**	**17,989**
Cash and cash equivalents, as of beginning of year	0	938	64,753	54,654	36,925	32,887	51,001	81,202	120,559	162,826	191,696	216,800	239,376	259,411
Cash and cash equivalents, as of end of year	938	64,753	54,654	36,925	32,887	51,001	81,202	120,559	162,826	191,696	216,800	239,376	259,411	277,401

Source: Kindred Biosciences Form S-1, BMO Capital Markets Pharmaceuticals Research

Kindred Biosciences (KIN)



FYE (Dec.)	EPS US$	P/E Hi - Lo	DPS US$	Yield% Hi - Lo	Payout %	BV US$	P/B Hi - Lo	ROE %
Range*:		na na		NC			>15 >15	
Current*	ND	na	0.00	0.0	na	NA	NA	na

KIN - Rating as of 19-Dec-13 = NR

* Current EPS is the 4 Quarter Trailing to Q3/2013.
* Valuation metrics are based on high and low for the fiscal year.
* Range indicates the valuation range for the period presented above.

Last Price (December 31, 2013): $11.17
Sources: IHS Global Insight, Thomson Reuters, BMO Capital Markets.

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Methodology: DCF and P/E Multiple
Risks: Success of pipeline assets, particularly CereKin

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Buy	Outperform	35.8%	20.3%	47.8%	36.7%	48.3%	52.6%
Hold	Market Perform	59.4%	13.1%	51.1%	56.9%	50.2%	41.7%
Sell	Underperform	4.9%	3.4%	1.1%	6.4%	1.5%	5.6%

* Reflects rating distribution of all companies covered by BMO Capital Markets Corp. equity research analysts.
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