

SCYNEXIS, Inc. (SCYX)

Initiating Coverage of Scynexis at Market Outperform with a \$15 Price Target - Wanted: A New Antifungal

MARKET DATA

Price	\$8.40
52-Week Range:	\$7.92 - \$9.84
Shares Out. (M):	8.5
Market Cap (\$M):	\$71.4
Average Daily Vol. (000):	66.0
Cash (M):	\$55
LT Debt (M):	\$8

Source: Thomson Reuters and JMP Securities LLC

MARKET OUTPERFORM | Price: \$8.40 | Target Price: \$15.00

INVESTMENT HIGHLIGHTS

Initiating coverage of Scynexis at Market Outperform with a \$15 price target based on a risk-adjusted, discounted cash flow analysis. Wanted: A new antifungal - Scynexis is developing SCY-078, a novel antifungal agent for serious systemic fungal infections. We see SCY-078 as a potential leader in this market as it could be the first non-azole with both IV and oral formulations. With a 75% share of the \$3B systemic antifungal market, the azole class has come under scrutiny because of growing resistance and there is a move to shift first-line therapy to new classes. Strong in vitro potency and a clean profile in healthy subjects has encouraged the company to move this program forward into Phase 2 development in patients and we see proof-of-concept data from this trial, expected mid-2015, as the next value-creating event for the company following its IPO last month. While the program is early, as a qualified infectious disease product (QIDP), management can expedite SCY-078 development toward a 2018 launch, and we project 2024 peak sales of ~\$480, with a conservative assumption of 10% share. However, with solid Phase 3 data in hand, we think Scynexis can attract a partner looking to expand its hospital-based infectious disease portfolio.

Rising resistance creates need. Increased resistance to medicines once effective against invasive fungal infections is a serious concern for at-risk patients. The azole class of antifungal agents has led the market due to its availability in both IV and oral formulations; however, widespread resistance is causing a rethinking of guidelines, moving the echinocandin class into first line for invasive candidiasis. If approved, SCY-078, would be the only echinocandin-like agent available as both IV and oral.

Quick-to-market strategy. With QIDP status, Scynexis can accelerate development evaluating SCY-078 with a single-arm study in the multidrug-resistance (MDR) setting. This will be the only Phase 3 study required for approval, which we anticipate could be as soon as 2018. Later studies will likely expand the label into front-line therapy.

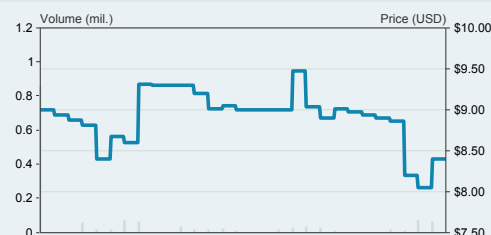
Minimal competition. Our pipeline analysis shows that SCY-078 is the only IV and oral antifungal product in clinical development for invasive infections outside of isavuconazole, an azole that we do not view as a direct competitor to SCY-078. Therefore, with a potentially broad label for invasive fungal infections and status as the first IV and oral echinocandin-like agent, we think SCY-078 is well positioned to be the market leader for invasive fungal infections.

Key player in fungal world steering development. SCY-078 was developed via collaboration with Merck until the full rights of the compound were returned to Scynexis in 2013. We are pleased that Scynexis was able to hire Carole Sable, who was instrumental in the development of Merck's caspofungin, the top-branded echinocandin. We view her move to Scynexis this year as an endorsement of the compound's potential.

FY DEC	2013A	2014E	2015E
Revenue (\$M) 1Q	--	\$3.7	--
2Q	--	\$3.7	--
3Q	--	\$3.7	--
4Q	--	\$3.7	--
FY	\$16.9	\$14.8	\$14.8
EPS 1Q	--	(\$0.20)	--
2Q	--	(\$0.28)	--
3Q	--	(\$0.37)	--
4Q	--	(\$0.52)	--
FY	(\$0.14)	(\$1.36)	(\$2.45)

Source: Company reports and JMP Securities LLC

STOCK PRICE PERFORMANCE



INVESTMENT THESIS

IV and oral set this compound apart

Increased resistance to medicines once effective against invasive fungal infections is a serious concern for at-risk patients. The \$10 billion antifungal market is comprised of three drug classes: azoles, polyenes, and echinocandins. The azole class is the most widely used given the convenience of both IV and oral formulations; however, rising resistance has prompted a change in European guidelines recommending the echinocandin class as first line and we anticipate forthcoming U.S. guidelines could reflect the same sentiment. Unfortunately, the echinocandin class is only available in IV form, rendering it less convenient and more expensive to administer than the azoles and the polyenes are used as a last resort due to toxicity. In our opinion, this defines the opportunity for Scynexis.

Quick-to-market strategy

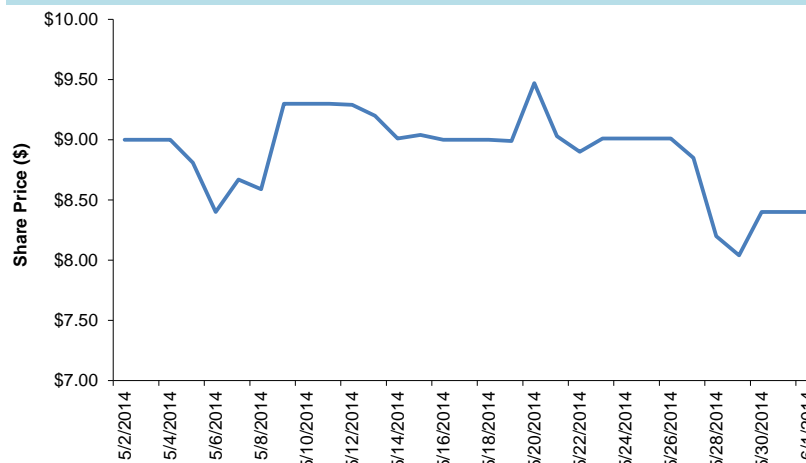
Scynexis' SCY-078 is a novel IV and oral antifungal agent with the same mechanism of action as the echinocandin class. The company has evaluated SCY-078 in many in vitro assays and preclinical animal models, showing solid potency against common and resistant strains. Phase 1 studies have been completed in over 100 healthy subjects showing a tolerable and safe profile, with no reports of gastrointestinal toxicity, which was a finding in two animal species at doses 2-3 fold higher than those expected to deliver efficacy in humans. On the basis of this data package, Scynexis is moving into Phase 2 development for the oral formulation, with the IV formulation slightly behind. With qualified infectious disease product status (QIDP) in hand, Scynexis can accelerate development using SCY-078 as a single-arm study in the multidrug-resistance (MDR) setting as the single trial for registration in the U.S. With this strategy, we think approval could come as soon as 2018. A second Phase 3 study in the front-line invasive candidiasis setting will be initiated in parallel, but we expect this study will complete post-approval and be used to broaden the label. Eventually the company will undertake a study in invasive aspergillosis, a more rare, but difficult-to-treat fungal infection requiring a longer course of therapy.

Minimal competition

SCY-078 is the only IV and oral antifungal product in clinical development for invasive infections outside of isavuconazole, an azole that we do not view as a direct competitor to SCY-078. Digging further, we find one IV and oral drug candidate in preclinical development for invasive fungal infections by Seachaid, and we project this compound is likely 2-3 years behind Scynexis' SCY-078. With a broad label for invasive fungal infections and as the first IV and oral compound to inhibit the target of the echinocandins, we think SCY-078 is well positioned to be the market leader for invasive fungal infections.

Key player in fungal drug development on board

As a reminder, SCY-078 was developed via collaboration with Merck until the full rights of the compound were returned in 2013 to Scynexis. We are pleased that Scynexis was able to hire Carole Sable, who was instrumental in the development of Merck's caspofungin, the top branded echinocandin. For this reason, she is uniquely suited to develop SCY-078 and we view her move to Scynexis this year as an endorsement of the compound's potential.

FIGURE 1. Price Chart**STOCK PRICE PERFORMANCE**

Source: JMP Securities LLC and Company reports

VALUATION

Our \$15 price target is based on a risk-adjusted, discounted cash flow analysis of potential revenues for SCY-078 in the U.S. and Europe, with minimal contribution from the company's contracting R&D business. Given that the primary focus for Scynexis is the antifungal program, we do not model the company's cyclophilin or animal health pipeline, which, if successful, would be upside to our valuation.

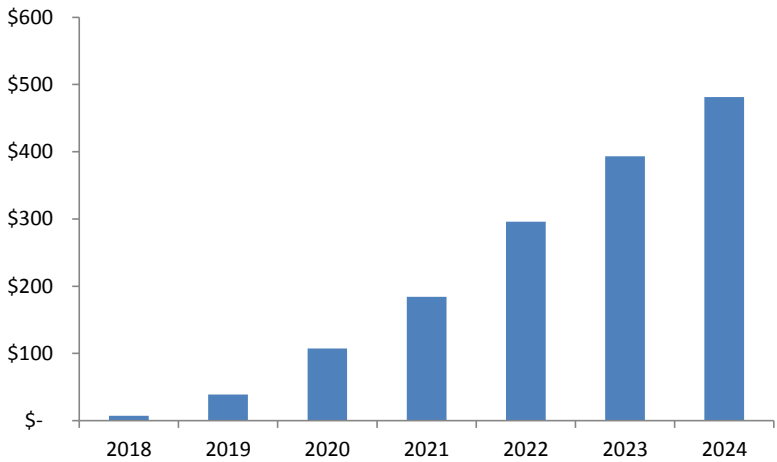
At 5-6% growth per annum, systemic antifungal infections are growing rapidly. This growth is driven by the increased use of immunosuppressive therapies in transplant and cancer patients, putting them at risk for fungal infections, as well as the greater use of long-term antibiotics, creating an environment ripe for opportunistic fungal infections. Over 14 million patients are at risk for the development of systemic fungal infections in the major pharmaceutical markets (i.e., U.S., UK, Germany, France, Italy, and Spain) and 600,000 infections occur each year worldwide. Of the various pathogens, candidiasis and aspergillosis are found in 80% of infections in the U.S. and EU. Each year, about 150,000-180,000 courses of therapy for candidiasis are administered in the U.S.

Given the serious nature of these infections, pricing has been relatively healthy, although we detect some price sensitivity in the hospital setting where treatment is initiated. The most commonly used echinocandin, micafungin, from Astellas is priced at \$250 per day, whereas caspofungin from Merck is ~\$450 per day. In Europe, these agents are reimbursed at ~\$400 per diem. As the only IV and oral option, we think SCY-078 can justify charging a premium as an oral formula, but may be priced to compete with micafungin in the hospital market, so we currently assume \$250 per day for the IV and \$400 per day for the oral formulations. For candidiasis, we assume patients will receive a total of 21 days of therapy on average, comprised of one week IV and two weeks of oral treatment. With

European guidelines now recommending the echinocandin class as front line and with the U.S. anticipated to follow, we believe that, as the only IV to oral option in the market, SCY-078 can capture 10% at peak in 2024. We assume similar market assumptions in Europe where the company will likely partner the product as it nears commercialization.

With these assumptions, modeling 10% penetration into systemic candidiasis and aspergillosis, we arrive at peak sales of ~\$480M in 2024 (Figure 2). Given the early stage of the program, we assume a 30% chance this product is approved and discount the program accordingly. For the purposes of our model, we assume the company builds organically to market the agent into the ID community with a sales force of ~100 each in the U.S. and EU. Although we think the product could be a nice acquisition for a company such as Cubist (CBST, MO, \$80 PT), with an established presence in the hospital infectious disease market and so, it may ultimately choose to find a strategic partner or sell. We project Scynexis will spend ~\$30M through Phase 2 development of SCY-078, which we view as an inflection point for the stock, and ~\$40M for Phase 3 development. Finally, we use a 12% discount rate for cash flows, which we view as current industry standard. We estimate the company currently has roughly 9.9M shares outstanding, and will have \$55M cash and \$7.5M in debt following its IPO and partial debt repayment. Utilizing these assumptions, we arrive at a price target of \$15.

FIGURE 2. JMP SCY-078 Revenue Projections (millions), 2018E-2024E



Source: JMP Securities LLC and Company reports

Benchmarking against more advanced companies in the anti-infective space suggests to us that Scynexis can gain significant value as SCY-078 moves through development (Figure 3). We also point to recent acquisitions in the antibiotic space of Trius and Optimer at ~\$700M and \$535M, respectively, as benchmarks for the potential future value of Scynexis.

FIGURE 3. Peer Analysis (in millions)

Company	Ticker	Price	Market Cap	Cash	Debt	EV	Stage of Dev.	Lead Product
Tetraphase	TTPH	\$10.54	\$272	\$89	\$17	\$200	Phase 3	Eravacycline
Cempra	CEMP	\$9.46	\$314	\$80	\$15	\$249	Phase 2/3	Solithromycin
Achaogen	AKAO	\$14.03	\$248	\$85	\$6	\$169	Phase 2/3	Plazomicin
Enanta	ENTA	\$37.98	\$704	\$102	\$0	\$602	Reg. Review	ABT-450
Idenix	IDIX	\$6.27	\$946	\$122	\$0	\$824	Phase 2/3	Samatasvir
Mean			\$497			\$409		
Median			\$314			\$249		
Scynexis	SCYX	\$8.40	\$73	\$55	\$8	\$25		SCY-078

Source: Company reports and JMP Securities LLC

FIGURE 4. Upcoming Catalysts

Time	Event	Program
2H14	Updated IDSA guidelines for Candida	
2015	Phase 2a safety data - oral formulation	SCY-078
2015	Phase 1 safety data - IV formulation	SCY-078
2017-2018	Phase 2/3 pivotal trial data	SCY-078

Source: Company reports

FIGURE 5. DCF Valuation Analysis

Discounted Cash Flow Valuation													
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Terminal
Revenues	11,125	14,833	15,083	15,083	7,147	38,952	107,259	184,197	295,856	393,116	481,420	544,541	
<i>SCY-078</i>	-	-	-	-	7,147	38,952	107,259	184,197	295,856	393,116	481,420	544,541	
<i>License fees and milestones</i>	11,125	14,833	15,083	15,083	-	-	-	-	-	-	-	-	
COGS	10,761	14,348	14,589	14,589	357	5,843	13,944	20,262	29,586	39,312	48,142	54,454	
<i>R&D as % of Revenues</i>	-	148%	199%	199%	280%	39%	19%	8%	5%	4%	3%	3%	
R&D	7,613	22,000	30,000	30,000	20,000	15,000	20,000	15,000	15,000	15,000	15,000	15,000	
<i>SG&A as % of Revenues</i>	4,492	5,000	6,500	15,000	30,000	45,000	30,000	45,000	45,000	58,500	70,200	84,240	
SG&A	3,385	5,000	6,500	15,000	30,000	45,000	30,000	45,000	45,000	58,500	70,200	84,240	
Operating Income (EBIT)	(10,634)	(26,514)	(36,006)	(44,506)	(43,210)	(26,891)	43,315	103,936	206,271	280,304	348,078	390,847	
Weighted Risk	Prob of Success	100%	100%	100%	100%	30%	30%	30%	30%	30%	30%	30%	
<i>SCY-078</i>	30%	0%	0%	0%	30%	30%	30%	30%	30%	30%	30%	30%	
<i>License fees and milestones</i>	100%	100%	100%	100%	0%	0%	0%	0%	0%	0%	0%	0%	
Tax	0%	0%	0%	0%	0%	0%	5%	10%	20%	30%	35%	38%	
Risk adjusted Net Income	(10,634)	(26,514)	(36,006)	(44,506)	(43,210)	(26,891)	12,345	28,063	49,505	58,864	67,875	72,698	605,813
Year for discounting	0	0.75	1.75	2.75	3.75	4.75	5.75	6.75	7.75	8.75	9.75	10.75	11.75
	\$ (10,634)	\$ (26,514)	\$ (36,006)	\$ (44,506)	\$ (28,250)	\$ (15,697)	\$ 6,434	\$ 13,059	\$ 20,569	\$ 21,837	\$ 22,482	\$ 21,499	\$ 159,966
NPV	\$ 104,238												
+ Current Cash & Equivalents	\$ 54,599												
Value of the Company	\$ 158,838												
- L-T Debt	\$ 7,500												
Value of Equity	\$ 151,338												
Value per Share	\$ 15.30												

Source: JMP Securities LLC and Company reports

FIGURE 6. Actual and Projected Income Statement

	2012A	2013A	Q1E	Q2E	Q3E	Q4E	2014E	2015E	2016E	2017E	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E
Revenue																		
SCY-078							\$0	\$0	\$0	\$0	\$7,147	\$38,952	\$107,259	\$184,197	\$295,856	\$393,116	\$481,420	\$544,541
Licensing and royalty revenue	\$16,837	\$16,857	\$3,708	\$3,708	\$3,708	\$3,708	\$14,833	\$14,833	\$15,083	\$15,083	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total Revenue	\$16,837	\$16,857	\$3,708	\$3,708	\$3,708	\$3,708	\$14,833	\$14,833	\$15,083	\$15,083	\$7,147	\$38,952	\$107,259	\$184,197	\$295,856	\$393,116	\$481,420	\$544,541
Operating Expenses																		
R&D	8,927	4,363	1,102	1,113	2,500	4,000	8,714	22,000	30,000	30,000	20,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000
SG&A	4,742	4,381	1,106	1,117	1,128	1,140	4,492	5,000	6,500	15,000	30,000	45,000	58,500	70,200	84,240	96,876	106,564	111,892
Other	(3,412)	(988)	0					0	0	0	0	0	0	0	0	0	0	0
Total Op. Expenses	10,257	24,061	5,795	5,817	7,215	8,727	27,554	41,348	51,089	59,589	50,357	65,843	87,444	105,462	128,826	151,188	169,706	181,346
Operating Income	6,580	(7,204)	(2,086)	(2,109)	(3,507)	(5,018)	(12,720)	(26,514)	(36,006)	(44,506)	(43,210)	(26,891)	19,815	78,736	167,031	241,928	311,715	363,195
Other Revenue/Expenses																		
Total	(3,693)	(23,257)	(202)	(189)	(76)	(80)	(547)	61	103	86	32	169	59	74	302	823	1,671	2,808
Pretax Income	2,887	(30,461)	(2,288)	(2,298)	(3,583)	(5,098)	(13,267)	(26,454)	(35,903)	(44,420)	(43,178)	(26,722)	19,874	78,810	167,332	242,751	313,386	366,004
Tax rate								0%	0%	0%	0%	0%	5%	10%	20%	30%	35%	38%
Income Tax	-	-	-	-	-	-	-	-	-	-	-	-	994	7,881	33,466	72,825	109,685	139,081
other		(16,348)																
Net Income	\$2,887	(\$46,809)	(\$2,288)	(\$2,298)	(\$3,583)	(\$5,098)	(\$13,267)	(\$26,454)	(\$35,903)	(\$44,420)	(\$43,178)	(\$26,722)	\$18,880	\$70,929	\$133,866	\$169,926	\$203,701	\$226,922
Basic EPS	\$0.43	(\$0.14)	(\$0.20)	(\$0.28)	(\$0.37)	(\$0.52)	(\$1.36)	(\$2.45)	(\$2.70)	(\$3.00)	(\$3.03)	(\$1.69)	\$1.24	\$4.23	\$8.23	\$9.56	\$11.79	\$12.08
Diluted EPS	\$0.43	(\$0.14)	(\$0.17)	(\$0.22)	(\$0.31)	(\$0.43)	(\$1.13)	(\$2.07)	(\$2.35)	(\$2.65)	(\$2.65)	(\$1.50)	\$1.09	\$3.78	\$7.33	\$8.59	\$10.57	\$10.92
Average Basic Shares	6,643	335,612	11,488	8,239	9,583	9,783	9,773	10,783	13,273	14,783	14,273	15,783	15,273	16,783	16,273	17,783	17,273	18,783
Average Diluted Shares	6,643	335,612	13,488	10,239	11,583	11,783	11,773	12,783	15,273	16,783	16,273	17,783	17,273	18,783	18,273	19,783	19,273	20,783

Source: JMP Securities LLC and Company reports

INVESTMENT RISKS

Clinical risk. Although efficacy of SCY-078 has been demonstrated in animal models, it has not yet been proven in humans. There is risk that the proof-of-concept study will not show efficacy compared to other classes of antifungals. It is also possible that the doses chosen for the first study will not be the optimal doses of SCY-078. SCY-078 was well tolerated in healthy volunteers; however, we do not yet know if this will translate to patients, especially with a pre-clinical signal of degradation of the stomach lining in animals. Scynexis is also preparing an IV form of SCY-078; however, this formulation has not yet been tested in humans and therefore, the viability is not yet known.

Regulatory risk. SCY-078 has QIDP status, however, this does not guarantee approval. Changes in FDA guidance could delay the path for SCY-078 to reach the market.

Commercial risk. SCY-078 will be launched into the hospital market where formulary access can be slow and launches tend to be sluggish. In the hospital setting, there is competition from other classes of antifungals that are already entrenched. There are many generics available in this setting that can also make it difficult for Scynexis to gain share with SCY-078.

Sector risk. Valuation of pharmaceutical stocks is subject to both investor assessments of the prospects of the underlying companies as well as investor tolerance for risk and confidence in the prospects of pharmaceutical stocks as a group. Therefore, Scynexis' stock price may fall, even while the company meets or exceeds investor expectations.

Patent risk. SCY-078 is covered by a composition of matter patent and QIDP protection. However, after 10 years exclusivity of QIDP has expired, patents for SCY-078 can be challenged. At this time, there are patent applications pending to strengthen the position of SCY-078; however, they may not be awarded.

MARKET OPPORTUNITY AND COMMERCIALIZATION

Large market opportunity

Antifungal agents are used to treat infections ranging from common ailments, such as toenail infections to rare, but life-threatening events, such as ICU blood stream infections. Fungal infections are relatively common in hospitals. In a survey of ICUs in Europe and North America, candida (fungal) blood stream infections were the second most prevalent infection after staph infections.

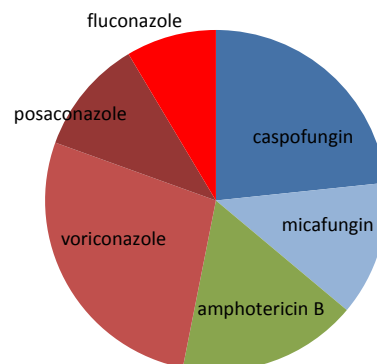
Fungi are divided into three groups: yeasts, molds, and dermatophytes. Only ~180 of the 250,000 species cause disease. Some fungi are highly pathogenic and can establish a systemic infection in otherwise healthy individuals, while others cause disease primarily in patients with a weakened immune system. Patients most at risk are in the ICU or are immune-compromised (i.e., transplant, cystic fibrosis patients, or those on immunosuppressant therapy). At 5-6% per annum, the growth of these infections is outpacing that of the population.

Eighty percent of invasive fungal infections are caused by candida or aspergillus, where mortality rates of 40% have been reported.

- Candida is yeast, naturally found on the mucosal surfaces of the mouth, the gut, and the female reproductive system. Thus, candida infections are opportunistic and often occur on one of these three surfaces. These infections can usually be treated, but drug resistance is on the rise. Candida can also cause serious systemic infections, representing roughly 80% of systemic fungal infections in the U.S. and EU.
- Aspergillus is mold that spreads through the air and can cause serious pulmonary and bloodstream infections in immune-compromised persons (e.g., cancer, transplant, HIV). Invasive aspergillosis occurs less frequently, causing only 10% of infections; however, it is a devastating infection with high mortality rates of > 50%.

Antifungal agents are divided into three classes: triazoles (azoles), polyenes, and echinocandins. At over \$10B, the antifungal market is large, although the systemic infection market is only part of this. The antifungal market reached \$2.8B in worldwide sales in 2013, with 47%, 36%, and 17% share of dollars attributed to the azoles, echinocandins, and polyenes, respectively, with most of the azole volume attributed to generics (Figures 7 and 8).

FIGURE 7. Market Share of \$2.8B in 2013



Red = azoles; Blue = echinocandins; Green = polyenes

Source: Company reports

FIGURE 8. Antifungal Sales by Indication

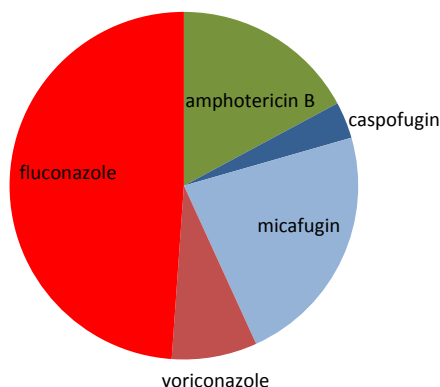
Leading Branded Products	2013 Sales	Indication
Vfend (voriconazole)	\$775 million	Treatment of Aspergillosis
Candidas (caspofungin)	\$660 million	Treatment of Systemic Candidiasis
Mycamine (micafungin)	\$360 million	Treatment of Systemic Candidiasis
Noxafil (posaconazole)	\$309 million	Prophylaxis of Systemic Candidiasis

Leading Generic Products	Peak Sales (year)	Indication
Diflucan (fluconazole)	\$1.2 billion (2003)	Treatment and Prophylaxis of Systemic Candidiasis; VVC; Esophagealcandidiasis
Lamisil (terbinafine)	\$1.2 billion (2004)	Treatment of Onychomycosis
Sporanox (itraconazole)	\$450 million (2000)	Treatment of Candida, Onychomycosis
Penlac (ciclopirox)	\$300 million (2002)	Treatment of Onychomycosis

VVC = vulvovaginal candidiasis

Source: Company reports








































There are six branded antifungals in use. The azoles (fluconazole, posaconazole, and voriconazole) are the most popular given availability as both IV and oral formulations despite the potential for many drug-drug interactions as they are substrates and inhibitors of CYP3A4. Polyenes are the least popular due to safety issues, including nephrotoxicity. Echinocandins capture ~25% market share of hospital prescriptions with micafungin use higher than caspofungin due to its competitive pricing strategy; the drug came to market at close to half the price of caspofungin (Figure 9).

FIGURE 9. Market Share 2013 (units injectable)

Red = azoles; Blue = echinocandins; Green = polyenes

Source: Company reports and JMP Securities LLC

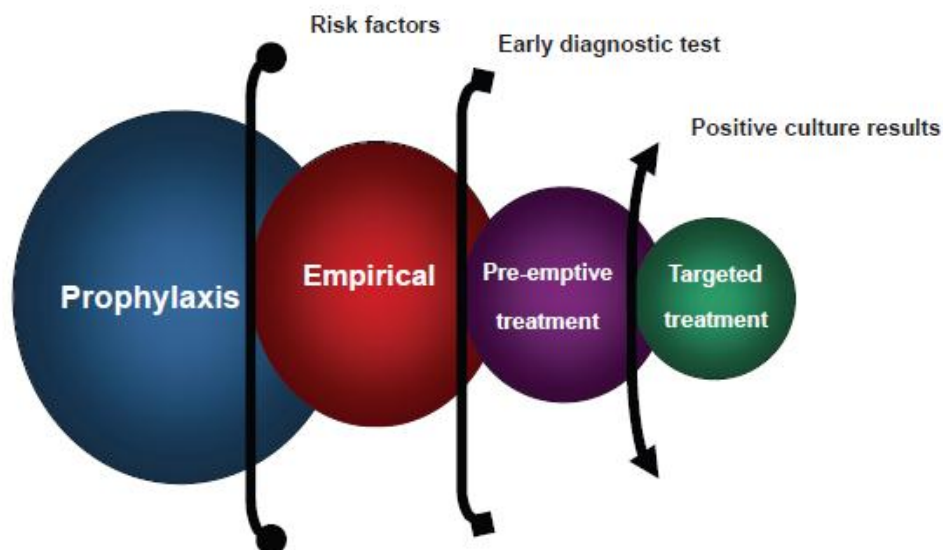
FIGURE 10. Overview of Antifungal Market

	Azoles				Echinocandins			Polyenes	Enfumafungin
Examples	fluconazole	voriconazole	posaconazole	isavuconazole (Phase 3)	micafungin	anidulafugin	caspofungin	AmBisome	SCY-078 (Phase 2)
Mechanism	Block fungal ergosterol biosynthesis				Block beta-1,3 glucan synthesis			Binds to ergosterol	Block beta-1,3 glucan synthesis
Approved for treatment of invasive candidiasis									
IV and oral									
Drug-drug interactions									
Side effects									
Resistance									
WW Sales (2013)	\$242M	\$775M	\$309M	n/a	\$360M	n/a	\$660M	\$481M	n/a

Source: Company reports

Many patients thought to be at risk for fungal infections are treated empirically, suggesting the market is larger than the 50,000-60,000 cases confirmed each year (Figure 11). For example, if a patient is on antibiotics and not improving on therapy, an antifungal may be added to care. If the patient improves, dosing continues; however, often these cases are not confirmed as fungal infections. Scynexis estimates that the worldwide incidence of invasive candida infection is ~600,000.

FIGURE 11. Antifungal Treatment Paradigm

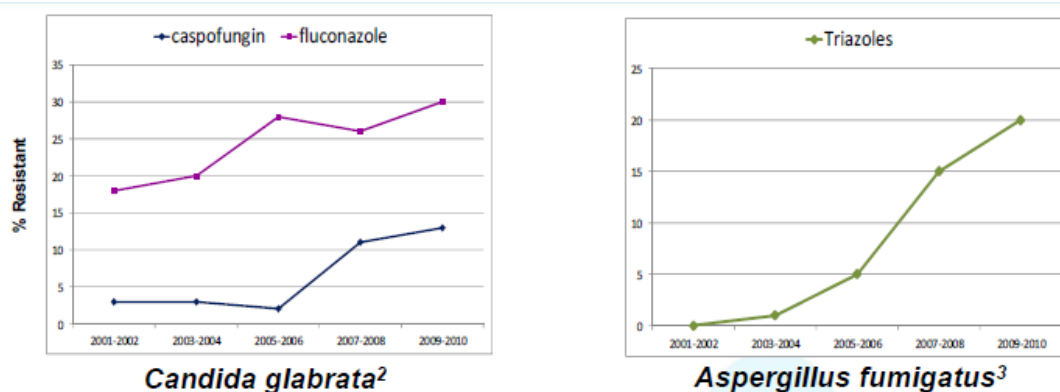


Source: *Therapeutics and Clinical Risk Management* 2008;4(6) 1261–1280

RESISTANCE CREATES NEED FOR NEW AGENTS

Unfortunately, drug resistance is on the rise, with some strains being multidrug resistant, creating an urgent need for new therapies. Whereas 20 years ago, 80% of the *candida* infections were *c. albicans* - a strain susceptible to many antifungal drugs, today only 50% of strains are *c. albicans* given the rise of resistant strains such as *c. glabrata* (25%) and *c. krusei* (10%). The prevalence of strains such as *c. glabrata* is on the rise (Figure 12) and these strains are inherently less susceptible to antibiotics than *c. albicans*.

FIGURE 12. Growth in Resistant Strains Underlies Need for New Drugs



Source: Company reports

The FDA has acknowledged the urgency of the situation, recently adding *candida* and *aspergillus* as qualifying pathogens under the Generating Antibiotics Incentives Now (GAIN) Act. Moreover, the increase in resistance for the azole class has led to a change of guidelines in Europe (ECCMID) in 2012 for candidemia and invasive candidiasis with echinocandins recommended as first-line therapy, followed by polyenes and then fluconazole due to resistance (Figure 13). Today, no echinocandin is available in both IV and oral form, so there is an unmet need for an oral option to expedite hospital discharge and reduce costs.

We anticipate that IDSA will follow suit when it publishes its updated guidelines later this year. The IDSA guidelines were last modified in 2009 and recommend fluconazole as first line for candidemia or suspected candidiasis for non-neutropenic adults.

FIGURE 13. U.S. and EU Guidelines for Non-neutropenic Adults

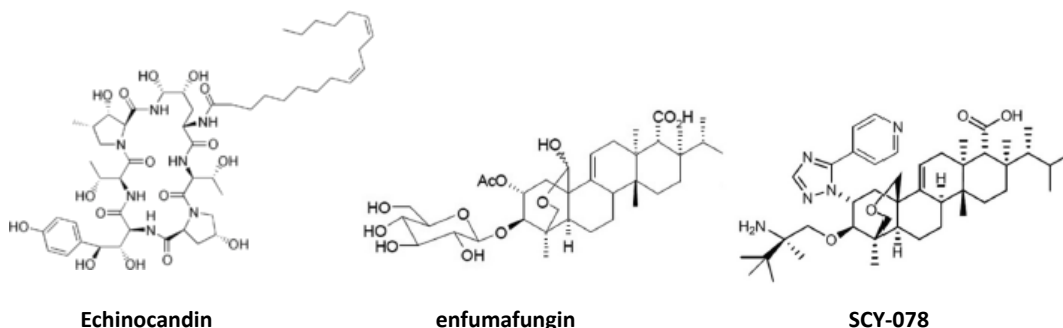
	IDSA guidelines (2009)	ESCMID guidelines (2012)
Primary	Fluconazole or echinocandin	Anidulafugin, Caspofungin, Micafungin
Alternative	LFAmB, AmB-d or voriconazole	LFAmB or voriconazole

Source: ESCMID and IDSA

SCY-078 – A NOVEL DRUG FOR AN ESTABLISHED TARGET

SCY-078 (formerly MK-3118) is an antifungal with broad activity against *candida* and *aspergillus*. The mechanism of action of SCY-078 (Figure 14) is related to that of the echinocandin class as it inhibits β -1,3 glucan synthase, a specific fungal target that catalyzes the formation of β -1,3 glucan, an important component of the fungal cell wall. Echinocandins are natural products with high molecular weights that cannot be formulated as oral agents. On the other hand, SCY-078 is an orally bioavailable, semi-synthetic derivative of enfumafungin, a naturally occurring antifungal isolated from fermentation of *Hormonema* sp. (Figure 14) that interacts with β -1,3 glucan synthase, but is structurally distinct from the echinocandins. This also suggests potential for non-overlapping resistance as key points of interaction between the compounds and the enzyme are likely unique.

FIGURE 14. Classes of Antifungals



Source: Company reports

In vitro efficacy supports broad activity of SCY-078

The *in vitro* activity of SCY-078 is better than azoles and comparable to echinocandins against many *candida* strains (Figure 15), although in our view, caspofungin appears slightly better. Activity against *aspergillus* appears comparable to caspofungin and better than the azoles (Figure 15). We are also encouraged by the *in vitro* activity of SCY-078 seen in strains resistant to fluconazole (Figure 16) and isolates with reduced susceptibility to caspofungin (Figure 17), supporting the non-overlapping interactions of SCY-078 and the echinocandins with β -1,3 glucan synthase.

FIGURE 15. Relative in Vitro Activity

	SCY-078	Caspofungin	Fluconazole	Voriconazole
Candida spp. (MIC 90%, mg/L)				
C. albicans	0.02	0.02	32.0	n/a
C. glabrata	0.25	0.13	32.0	n/a
C. krusei	1.00	0.13	32.0	n/a
C. parapsilosis	0.13	0.50	4.00	n/a
C. tropicalis	0.50	0.06	1.00	n/a
C. guilliermondii	1.00	0.50	16.0	n/a
Aspergillus spp. (MEC 90%, mg/L)				
A. fumigatus	0.01	0.02	n/a	0.25
A. flavus	0.02	0.03	n/a	2.00
A. niger	0.02	0.03	n/a	2.00

Minimum inhibitory concentration (MIC) and minimum effective concentration (MEC) measured according to CLSI guidelines, SCY-078 endpoint was 50% inhibition; "32" represents an undetermined value >32

Source: Company reports

FIGURE 16. Relative Potency in Fluconazole Resistant Strains

Strain	SCY-078	Caspofungin
C. albicans		
CLY9362	0.50	0.06
CLY9292	0.50	0.02
C. glabrata		
CLY16022	0.25	0.03
CLY666	0.13	0.06
CLY9366	0.25	0.03
C. krusei		
CLY9126	1.00	0.06
CLY9899	1.00	0.13

Values are MIC (mg/L), SCY-078 endpoint was 50% inhibition, caspofungin endpoint determined per CLSI M27-A3 for yeast

Source: Company reports

FIGURE 17. Potency Against Strains with Reduced Caspofungin Activity

Strain	FKS Genotype	SCY-078	Caspofungin
C. albicans			
CLY16998	wt/wt	0.03	0.13
CLY16996	S646F/S645F	0.03	1.00
CLY16997	S646P/S645P	0.13	4.00
CLY724	S648Y/S648Y	0.03	0.25
CLY16376	R1361H/R1361H	0.13	0.50
CLY18559	S646F/S645F	0.03	2.00
CLY19231	S646F/S645F	0.03	2.00
CLY18600	wt/S645S; wt/R136H	0.03	0.50
CLY24738	S645F/S645F; R1361H/R1361H	0.03	0.50
CLY719	F641L/F641L	0.03	0.25
CLY22916	F641S/F641S	2.00	2.00
C. krusei			
CLY10954	wt/wt	0.50	0.13
CLY16038	R1361G/R1361G	0.25	8.00

Values are MIC (mg/L), SCY-078 endpoint was 50% inhibition, caspofungin endpoint determined per CLSI M27-A3 for yeast; "0.03" represents an <0.03

Source: Company reports

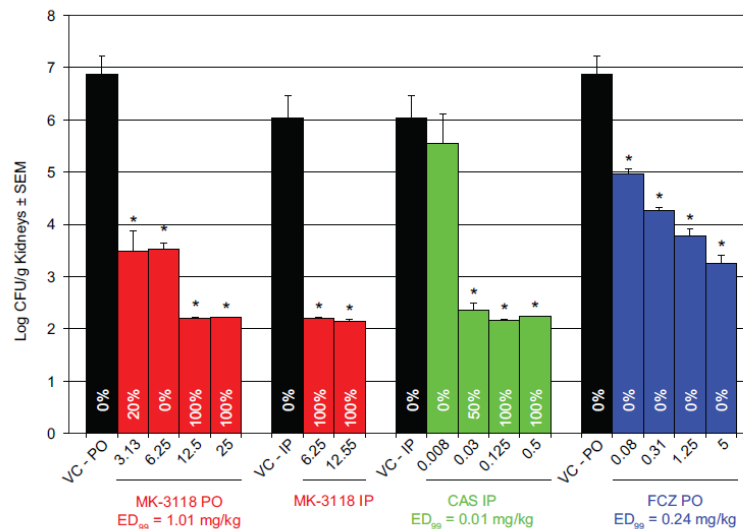
Animal models support improved outcomes

SCY-078 has been investigated in animal models of both candidiasis and disseminated aspergillosis; we note the aspergillosis models are often less robust due to high mortality rates.

For each study, immune-suppressed mice were infected with strains of fungus followed by administration of SCY-078 or a comparator. Therapy was initiated 15-30 minutes after the challenge for seven days.

- **Candidiasis.** Strains of *c. albicans* and *c. tropicalis* were used to infect complement-component deficient (DBA/2N) mice. Efficacy was measured by read-out of colony forming units (cfu) in the kidney after seven days of treatment. Both oral gavage (PO) and intra-peritoneal injection (IP) administration of SCY-078 were compared to caspofungin and fluconazole. We see a dose dependent upon effect of SCY-078 on units of *c. albicans* (Figure 18) and in the percentage of mice with no detectable yeast. At the highest doses of SCY-078, we believe data are comparable to caspofungin. Additionally, kidney burden was reduced 2.6-3.8 log cfu/g for the three *c. tropicalis* strains (not shown). Our conversations with management suggest these data, along with in vitro data, have helped to refine the dose of SCY-078 for human development, as this model was predictive in the development of caspofungin.

FIGURE 18. Candidiasis Efficacy Similar to Caspofungin

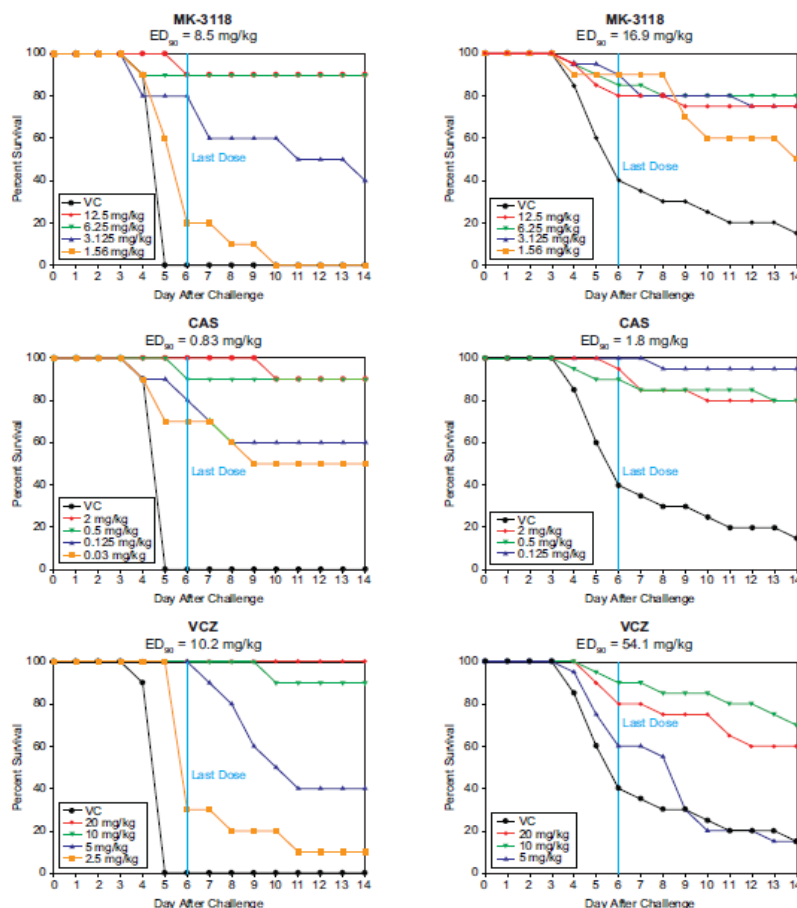


*=significant reduction from VC
 %=% of mice with no detectable yeast
 LOD = 50 cfu/pair of kidneys

MK-3118 = SCY-078, CAS = caspofungin, FCZ = fluconazole, PO = oral gavage, IP = intraperitoneal injection, VC = vehicle treated control, ED = effective dose, number on x-axis indicates BID dose in mg/kg.

Source: ICAAC 2010

- **Aspergillosis.** Infection was induced by inoculation with *a. fumigatus* MF5668 spores in complement-component deficient (DBA/2N) or cyclophosphamide-treated (CD-1) mice to mimic two different immune-repressed states. The read-out was survival compared to caspofungin and voriconazole-treated mice. A dose-dependent improvement of survival was observed compared to untreated mice with similar efficacy to caspofungin and fluconazole (Figure 19).

FIGURE 19. Animal Data Suggest SCY-078 Efficacy in Line with Other Classes

MK-3118 = SCY-078, CAS = caspofungin, VCZ = voriconazole

Source: ICAAC 2010

Preclinical safety finding

In 28-day toxicity studies in rats and dogs, degeneration of the stomach lining was observed. The insult was reversible, occurred early, and did not progress. The level of exposure where this was observed is 2.5-3x the level that is expected in humans. From a safety perspective, we view this as the greatest risk to the program, although we note that other approved therapies have also shown this signal in animals (e.g., tamoxifen, proton pump inhibitors). No human studies have yet to detect this signal.

Phase 1 studies suggest a reasonable therapeutic window

SCY-078 was evaluated in over 100 healthy volunteers in seven Phase 1 studies by Merck before returning the asset to Scynexis. The half-life of the compound is ~20 hours, supportive of QD dosing and pharmacokinetic modeling based on animal models, suggesting a target exposure of 15uM/hr could be achieved with a dose of approximately 500mg QD. To rapidly reach relevant exposure levels, the compound will be dosed with a loading dose on day one, similar to the azole class. The compound was tested up to 1,600mg in single, ascending dose studies and up to 800mg/kg in multiple, ascending dose studies through 28 days.

Common AEs were GI in nature and mostly mild. Of over 100 subjects on drug, only one serious adverse event (SAE) that appeared to be drug related was observed. A single subject with elevated liver enzymes at baseline had liver enzymes more than 10x the upper limit of normal which returned to baseline levels upon discontinuation of SCY-078. This observation is not unexpected given SCY-078 is metabolized in the liver and fortunately the effects are reversible. For the echinocandin class, enzyme elevations have been observed at 2-3x ULN and patients are at higher risk if they are also receiving cyclosporine, which is not uncommon in this at-risk population. If SCY-078 has a similar risk profile, we do not anticipate this to impede development or commercialization. Nonetheless, liver enzymes will be closely monitored in the next series of studies. In particular, we are encouraged that no stomach degeneration (observed in animals) was observed in gastric biopsies of healthy volunteers who received SCY-078 for 28 days at the highest dose (800mg/day).

Overall, the drug was tolerable at these levels and we note the human equivalent exposure levels that generated the GI toxicity signal in animals (stomach lining degradation) is 2-3 fold higher than the exposures observed with 800mg/kg and, thus, we are comfortable with the current therapeutic window.

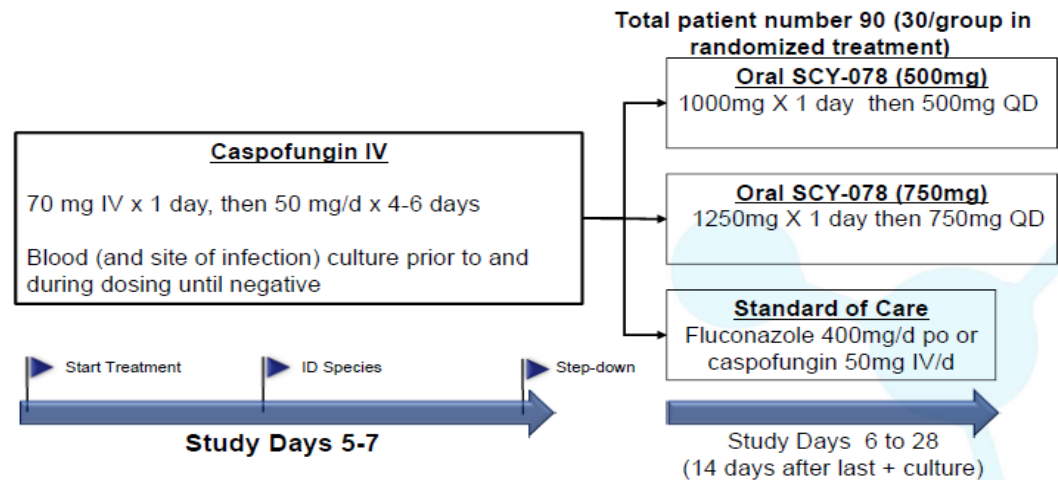
We look forward to data from the first study in patients to fully vet the compound's safety in the more relevant population.

FAST-TO-MARKET DEVELOPMENT STRATEGY

Next datapoint: Oral dose selection and safety

Scynexis will soon begin a Phase 2a dose-ranging study of SCY-078 in 90 patients with invasive candidiasis. Currently, only the oral formulation of SCY-078 is Phase 2 ready and therefore, the study will include a lead-in with IV caspofungin for 5-7 days, followed by a switch to oral SCY-078 or standard of care (SOC) (Figure 20). In this study, SOC will either be continued IV therapy or fluconazole 400mg QD for 14 days after the last positive culture or 28 days. Two dosing regimens of SCY-078 will be explored – high dose: 1,250mg loading followed by 750mg QD, or low dose: 1,000mg loading; 500mg QD of SCY-078.

The primary purpose of the study is to determine the dose required to achieve the target exposure of 15uMhr. The study will also be the first evaluation of safety in patients. Given the lead in phase with caspofungin, we believe an assessment of efficacy will be more challenging, although we will be interested to see how SCY-078 stacks up against step down to oral fluconazole. One specific area where we are looking for efficacy is in cases of *c. glabrata* and *c. krusei*, strains with known resistance to azoles and echinocandins.

FIGURE 20. Phase 2b Study Design

Source: Company reports

IV formulation in process

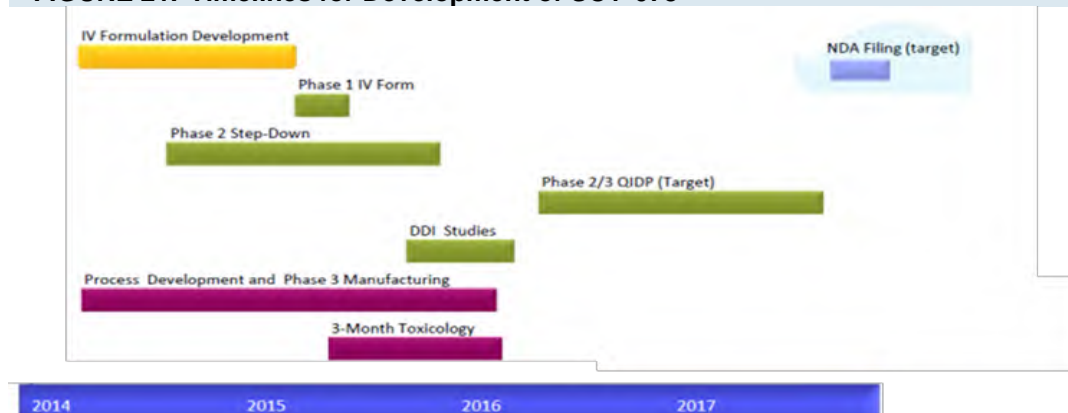
The morbidity and mortality associated with invasive *candida* infection necessitates a fast-acting IV formulation to achieve rapid blood levels of drug. Scynexis is preparing SCY-078 for injection and we anticipate Phase 1 studies will begin in early 2015. The company is planning to move into single dosing in rats and dogs this month with 28-day GLP toxicology studies early next year. Once the IV formulation is established, development should be expedited given the exposure targets will mirror those used in the upcoming Phase 2a study of the oral dose. We believe the IV to oral step-down feature is key to differentiating SCY-078 from others in the echinocandin class.

Additional workup of SCY-078 in 2015

Scynexis intends to complete three-month, preclinical toxicology and drug-drug interaction (DDI) evaluation of SCY-078 in 2015. As a reminder, DDIs are an issue with the azole class given the strong interaction with drugs commonly used in this population, including those for transplant (cyclosporine), oral contraceptives, NSAIDs and hypertension medications, among others. SCY-078 is metabolized by glucuronidation and CYP3A4. Therefore, we anticipate a need for dose adjustments with concomitant use of CYP3A4 inhibitors.

GAIN Act may facilitate accelerated timelines

With its QIDP designation, only one pivotal trial will be needed for approval of SCY-078. We project a first half 2016 start to the Phase 2/3 pivotal program (Figure 21). While at this early stage, plans for the study are still evolving, management's vision is to conduct a worldwide, single-arm study in multi-drug resistant patients using SCY-078 IV in all patients and a step down to oral dosing when possible. This will be the only study required for registration and we anticipate data in 2017. A second Phase 3 study in invasive candidiasis as first-line therapy will be executed for SCY-078 as an IV to oral step down, versus an IV echinocandin step down to azole. This study will likely take longer to enroll and, thus, we assume the data will support label expansion into front-line therapy of invasive candidiasis. Ultimately, the company intends to evaluate the role of SCY-078 in aspergillosis. Scynexis has yet to articulate its European strategy, but we suspect regulators there would also be willing to consider a fast-to-market strategy.

FIGURE 21. Timelines for Development of SCY-078

Source: Company reports

Minimal competition

Our assessment of the competitive landscape suggests minimal future competition with only one other compound in development for systemic fungal infection – isavuconazole from Astellas/Basilea, a new IV and oral azole, and a preclinical echinocandin from Seachaid Pharma. A third anti-fungal agent is in development for less serious infections. Of these, we view the Seachaid product as a potential future competitor that is about two years behind SCY-078 in development.

Isavuconazole is a new azole formulated for IV and oral administration. Astellas and partner Basilea conducted three Phase 3 studies. The first study - an open-label, safety study in renal impaired patients with aspergillosis or fungal disease caused by rare molds, yeast, or fungi - established non-inferiority to voriconazole with all-cause mortality of 20.2% and 18.6% for voriconazole and isavuconazole, respectively. The success rate of the two compounds was similar at 36.4% and 35%, respectively. Most adverse events were GI in nature and similar between arms. Treatment-related AEs were lower for isavuconazole (42.4%) than voriconazole (59.8%). Data from the other studies in patients with invasive *aspergillus* or *candida* will report out later this year with an NDA filing shortly thereafter. We expect isavuconazole will be viewed as better than voriconazole due to its good tolerability in patients with renal impairment, but resistance issues with the class will likely be a problem for widespread use.

SP 3025 from Seachaid Pharma is a novel echinocandin in preclinical development in both IV and oral dosage forms. Consistent with others in the class, SP 3025 is active against *Candida spp.* and *Aspergillus spp.* The echinocandin SP 3025 has potency comparable to that of echinocandins already approved. We view this as a runner-up to SCY-078.

VT-1161 from Viamet is a small molecule inhibitor of lanosterol demethylase (CYP51), an enzyme involved in the synthesis of fungal cell wall sterols. The compound is a potent and selective CYP51 inhibitor with broad activity against a wide spectrum of yeasts and dermatophytes. The molecule has shown robust activity in multiple preclinical animal models and demonstrated excellent oral pharmacokinetic and safety profiles. Viamet is conducting two proof-of-concept Phase 2a studies - the first trial is in patients with acute vulvovaginal candidiasis, the second is in onychomycosis, or fungal infection of the nail. This is a different market than that addressed by SCY-078 in invasive disease.

Corifungin from Acea Biotech is a polyene that is not currently in active development.

OTHER PLATFORMS ARE A SOURCE OF NON-DILUTIVE CAPITAL

Scynexis has two other platforms: cyclophilin inhibition and animal health. Scynexis has a variety of licensing and collaborations for these programs that we do not include in our valuation at this time. Management intends to focus its cyclophilin program on HBV and other viral infections through partnerships at no cost to investors, with potential for upside. We assume the research collaborations to be profit neutral.

- **SCY-7158.** Scynexis has developed SCY-7158 with the Bill & Melinda Gates Foundation and it is in Phase 1 development for sleeping sickness, focused on people in sub-Saharan Africa.
- **Aventis.** Scynexis has a license for compounds and patents for Aventis' cyclosporine derivatives that expires in December 2017. The license is exclusive for HIV/AIDS and non-exclusive in all other indications. Given the short patent window, we do not anticipate significant value related to this program.
- **Merial.** Scynexis has a non-exclusive agreement providing fee for service for Merial, the animal health subsidiary of Sanofi. Scynexis does not receive milestone payments for compounds that move forward.
- **Dechra.** Scynexis granted rights for SCY-641 to Dechra to treat dry eye in dogs while retaining rights for human use. The compound is a semi-synthetic derivative of cyclosporine with better drug-like properties and better distribution to the eye. Scynexis is eligible to receive up to \$670,000 in milestones and royalties on sales. The patents for SCY-641 expire in 2019.
- **Elanco.** Scynexis has a research collaboration with Elanco, the animal health unit of Eli Lilly. Scynexis will receive \$2.75M in 2014 and 2015 and \$3M in 2016 and 2017 for research services, as well as potential milestones and royalties.

INTELLECTUAL PROPERTY

Scynexis has 14 U.S. issued patents for composition of matter of novel compounds, one of which pertains to SCY-078 and expires in 2030 before extensions. Other patents covering formulation and methods of use for SCY-078, if granted, would expire from 2029-2035. SCY-641 is covered by various granted patents that expire between 2019 and 2029 (Figure 22).

FIGURE 22. Patent Estate

Patent	Type	Expiration
SCY-078	8,188,085	Composition of matter
	10 applications pending	2030
SCY-641	6,583,265	Composition of matter
	8,188,052	Methods of use
	8,551,952	Methods of use

Source: Company filings

SCYNEXIS MANAGEMENT

The Scynexis team has significant industry experience. In particular, Chief Medical Officer Carole Sable was responsible for the development of Merck's echinocandin, caspofungin, which we believe makes her uniquely suited to develop SCY-078, in our view. Although Dr. Sable was not in charge of infectious disease at the time Merck returned SCY-078 to Scynexis, we view her move to Scynexis this year as an endorsement of the compound's potential.

FIGURE 23. Management Team

		Prior experience
Yves Ribeill, PhD	President & CEO	Aventis, Rhone-Poulenc Rorer
Carole Sable, MD	Chief Medical Officer	Merck, Novexel
Chuck Osborne, Jr.	Chief Financial Officer	Nobex, Intl Murex Tech
Mike Garrett	VP, Corporate & Strategic Dev	Paramavent Partners, BTG
Vivian Doelling, PhD	VP, Animal Health	Laboratory Systems, Embrex, American Cyanamid
Eileen Pruette	General Counsel	Valeant, bioMerieux SA, GSK

Source: Company reports

FIGURE 24. Board of Directors

		Other Affiliations
Pamela Kirby, PhD	Chairman	Quintiles, Novo Nordisk, AZ, victrex, smith&nephew
Edward Penhoet, PhD	Director	AltaPartners, Chiron, Cymabay, Corcept, Zymogenetics
Laurent Arthaud	Director	Aventis, bpifrance, Rhone-Poulenc Rorer
Mounia Chaoui, PhD	Director	AtlasVenture, Cellerix, ActoGenix, FTX, Ventech
Ann Hanham, PhD	Director	Intermue, Celltrix, Endocyte, Burrill&Co, Otsuka
Patrick Langlois, PhD	Director	Aventism PJJ Conseils, Rhone-Poulenc Rorer
Jean-Yves Nothias, PhD	Director	Genomic Vision, vesale Parnters, SomaLogic, Bioforce

Source: Company reports

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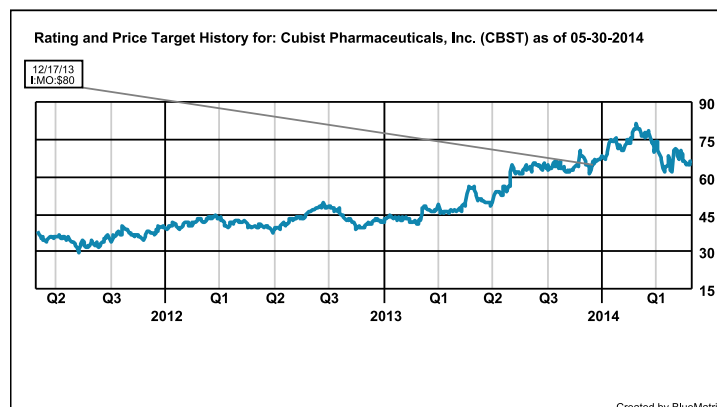
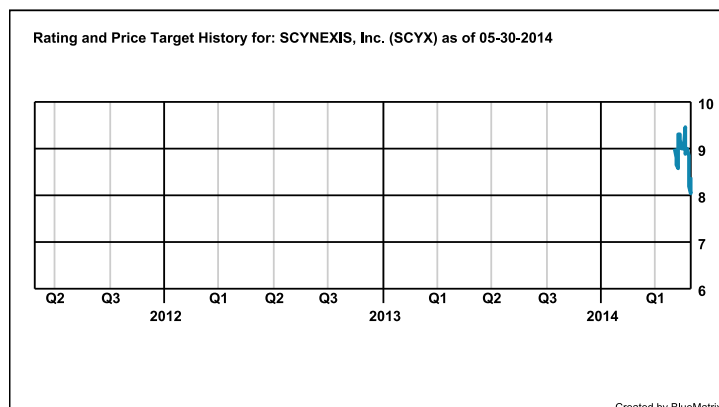
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MARKET OUTPERFORM	Buy	258	58.64%	Buy	258	58.64%	98	37.98%
MARKET PERFORM	Hold	134	30.45%	Hold	134	30.45%	16	11.94%
MARKET UNDERPERFORM	Sell	5	1.14%	Sell	5	1.14%	0	0%
COVERAGE IN TRANSITION		43	9.77%		43	9.77%	0	0%
TOTAL:		440	100%		440	100%	114	25.91%

Stock Price Chart of Rating and Target Price Changes:

Note: First annotation denotes initiation of coverage or 3 years, whichever is shorter. If no target price is listed, then the target price is N/A. In accordance with NASD Rule 2711, the chart(s) below reflect(s) price range and any changes to the rating or price target as of the end of the most recent calendar quarter. The action reflected in this note is not annotated in the stock price chart. Source: JMP Securities.



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