Akebia (AKBA)

Rating	**OUTPERFORM* [V]**
Price (11 Apr 14, US$)	16.86
Target price (US$)	25.00[1]
52-week price range	26.70 - 16.86
Market cap. (US$ m)	341.63
Enterprise value (US$ m)	235.97

**Stock ratings are relative to the coverage universe in each analyst's or each team's respective sector.*
[1]Target price is for 12 months.
[V] = Stock considered volatile (see Disclosure Appendix).

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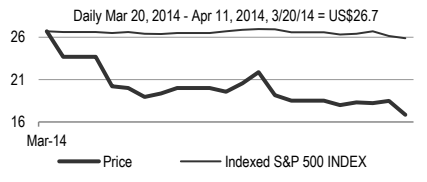
INITIATION

Elevating Anemia Treatment Via HIF Stabilizers

- **We are initiating coverage of Akebia (AKBA) with an Outperform rating and a $25 target price:** Founded in 2007, AKBA specializes in research and development of agents stabilizing hypoxia inducible factor α (HIFα). AKBA's lead pipeline asset is AKB-6548, which is being evaluated for anemia in chronic kidney disease on / not on dialysis (CKD-D and CKD-ND).
- **AKB-6548 could offer a more effective way to maintain/modulate hemoglobin (Hb) and improve upon cardiovascular safety:** The highly effective ESAs are currently relegated to treat more severe anemia because of FDA/EMA restrictions on their use due to cardiovascular safety concerns. Despite these concerns, the WW ESA market for anemia is still substantial at $6.4B, of which the majority (~$4.0B) is generated from CKD-ND and CKD-D. The current PIIa data have shown that AKB-6548 can increase Hb levels gradually in a clinically meaningful way without highly elevated levels of EPO, improves iron metabolism allowing for the potential to remove iron supplementation, and appears to be generally safe and well-tolerated.
- **Valuation:** Our DCF-derived target price of $25 assumes: (1) AKB-6548 is approved as a treatment for anemia in CKD-ND and CKD-D in the US, EU, and Japan. AKB-6548 is launched in the US, EU, and Japan in 2019, 2020, and 2021 respectively. (2) AKB-6548 generates peak revenues of ~$650M in 2026 from direct sales in the US and 20% royalties on sales in the EU and Japan. (3) Biosimilar EPO is launched in the US in 2015. (4) AKB-6548 is protected from generic competition until 2027. We risk weight our cash flow estimates by 50%. We note that our DCF currently does not include other indications for AKB-6548 as well as AKBA's other HIFα stabilizer, AKB-6899. We see topline PIIb data for AKB-6548 for anemia in CKD-ND due in Q4'14 as the key valuation-inflection point. Given the binary nature of the PIIb data readout and DCF dependence on one asset, AKBA is a high-risk investment.

Share price performance



On 04/11/14 the S&P 500 INDEX closed at 1815.69

Quarterly EPS	Q1	Q2	Q3	Q4
2013A	—	—	—	—
2014E	-0.74	-0.54	-0.79	-1.10
2015E	—	—	—	—

Financial and valuation metrics

Year	12/13A	12/14E	12/15E	12/16E
EPS (CS adj.) (US$)	-0.70	-1.48	0.17	1.49
Prev. EPS (US$)	—	—	—	—
P/E (x)	-24.0	-11.4	99.7	11.3
P/E rel. (%)	-140.1	-72.1	700.1	88.1
Revenue (US$ m)	—	—	40.0	80.0
EBITDA (US$ m)	-15.2	-28.0	3.8	35.6
OCFPS (US$)	-0.60	-1.36	0.36	1.70
P/OCF (x)	—	-12.4	46.4	9.9
EV/EBITDA (current)	-21.1	-8.4	39.3	2.9
Net debt (US$ m)	-21	-106	-193	-239
ROIC (%)	-167.02	-374.09	136.28	-1,737.60

Number of shares (m)	20.26	IC (current, US$ m)	9.54
BV/share (Next Qtr., US$)	—	EV/IC (x)	—
Net debt (Next Qtr., US$ m)	—	Dividend (current, US$)	—
Net debt/tot cap (Next Qtr., %)	—	Dividend yield (%)	—

Source: Company data, Credit Suisse estimates.

Investment Thesis

We are initiating coverage of Akebia (AKBA) with an Outperform rating and a $25 target price (TP). Founded in 2007, Akebia is a biopharmaceutical company based in Cambridge, Massachusetts. Akebia specializes in the research and development of agents that stabilize hypoxia inducible factor α (HIFα). Akebia's lead pipeline compound is AKB-6548, an orally administered HIFα stabilizer that is being developed as a potential treatment of anemia in chronic kidney disease not on dialysis (CKD-ND) and on dialysis (CKD-D). Akebia is currently enrolling the CI-0007 PIIb trial for anemia in CKD-ND and expects to initiate a PII trial for anemia in CKD-D in H1'14.

AKB-6548 mimics the "natural" physiological response to hypoxia (i.e., lack of adequate oxygen supply) usually triggered at higher altitudes. HIFα is normally targeted for destruction by hypoxia inducible factor prolyl hydroxylase (HIF-PH). AKB-6548 stabilizes HIFα by inhibiting HIF-PH. This action triggers a biological cascade. HIFα binds with HIFβ to form a complex in the nucleus of the cell. This complex upregulates transcription of erythropoietin (EPO) and iron transfer proteins. The increase in EPO and iron in the bone marrow leads to higher hemoglobin (Hb) and red blood cell (RBC) production.

Significant unmet needs remain in anemia in CKD. In general, physicians currently wait until CKD patients develop moderate to severe anemia (i.e., Hb < 7−8 g/dL) before treating with highly effective erythropoietin stimulating agents (ESAs). These Hb levels are significantly below the thresholds of Hb ≤ 13 g/dL for men and Hb ≤ 12 g/dL for women as defined by the World Health Organization (WHO). ESAs have been relegated to treating moderate to severe anemia in CKD patients mainly because of FDA and EMA restrictions on their use due to cardiovascular safety concerns raised by four clinical trials: Normal Hematocrit, CREATE, CHOIR, and TREAT.

Recent analyses suggest that levels of EPO rather than Hb could be the cause of cardiovascular safety issues. Safety data from these four major clinical studies mentioned have suggested that Hb raised the risk of adverse cardiovascular events. Specifically, it was noted that restoring Hb levels in CKD patients with anemia led to worse outcomes driven mainly by cardiovascular adverse events. However, recent post-hoc analyses of the safety data from these four clinical trials suggest that EPO could be the cause of the cardiovascular safety issues. There were two key findings: (1) The risk of adverse cardiovascular outcomes is highest at the highest ESA dose regardless of Hb levels. (2) The incidence of adverse events (heart failure, stroke, and myocardial infarction) is higher in patients with higher EPO and lower Hb levels (vs. patients with lower EPO and higher Hb levels).

AKB-6548 has the potential to be differentiated relative to ESAs by offering a more effective way to maintain/modulate Hb and improving upon cardiovascular safety. Recent PIIa data on AKB-6548 in anemia in CKD-ND have shown that: (1) AKB-6548 can drive clinically meaningful increases in Hb. AKB-6548 raised Hb by 0.7−1.4g/dL (at 240mg, 370mg, 500mg, and 630mg doses) relative to a decrease of 0.1g/dL for placebo at Week 6 ($p<0.0001$). (2) AKB-6548 raises Hb by stimulating RBC production. Increases in absolute reticulocyte counts preceding rises in Hb were observed clinically. (3) AKB-6548 improves RBC production without the need of highly elevated (i.e. non-physiological) levels of EPO in the body. There have been no appreciable differences in pre-dose EPO levels for all studied doses of AKB-6548 relative to the placebo throughout the study period. (4) AKB-6548 could improve iron metabolism, potentially eliminating the need for iron supplementation. A dose-dependent increase in iron as measured by total iron binding capacity (TIBC) was observed. (5) AKB-6548 appears to be generally safe and well-tolerated. The incidences of adverse events were generally balanced between AKB-6548 (47.2%) and the placebo (57.9%) cohorts, with frequencies distributed evenly across the AKB-6548 dosing groups. So far, there have been no serious adverse events (SAEs)

attributable to AKB-6548. There was a one death, which was not attributable to AKB-6548. In addition, AKB-6548 did not cause any statistically significant increase in vascular endothelial growth factor (VEGF), which could potentially promote tumor growth in cancers.

We see topline CI-0007 PIIb data due in Q4'14 is the key valuation-inflection catalyst. CI-0007 is a 200-patient trial examining AKB-6548 as a potential treatment for anemia in CKD-ND patients. It is important to note that CI-0007 will enroll CKD-ND patients with Hb ≤ 10.5g/dL, which is slightly above the FDA's recommendation of Hb < 10g/dL. Patients will be started at 450mg QD, followed by dose adjustments based on Hb responses. The primary endpoint is the percentage of patients who: (1) achieve or maintain Hb ≤ 11.0g/dL, or (2) increase Hb ≥ 1.2g/dL over pre-dose average Hb between screening and baseline. Akebia plans to run three registrational PIII trials. There will be two placebo-controlled, double-blind clinical trials of 700−900 patients each with an ESA rescue option. There also will be a comparability trial of 300 patients.

Development of HIFα stabilizers for treating anemia in CKD is highly competitive. Akebia is expected to be the second HIFα stabilizer on the market, following Fibrogen's (partnered with Astellas and AstraZeneca) FG-4592. Other companies that are developing HIFα stabilizers include GSK (GSK-1278863) and Bayer (BAY-85-3934). The key differentiating factors between these compounds will likely be in the ability to fine-tune Hb levels as well as the safety/tolerability profile.

The worldwide ESA market for anemia is still substantial at $6.4B, with the majority (~$4.0B, 63%) generated from CKD-ND and CKD-D. Worldwide ESA sales peaked at $11.6B in 2006. However, sales have declined by 8.6% CAGR from 2006 to 2013, with more significant drops in the US (−11.4%) than Ex-US (−4.4%). This decrease in sales has been driven by a drop in ESA usage due to more conservative treatment recommendations from the FDA and EMA as well as reimbursement pressures (primarily in the US).

AKB-6548 is expected to generate peak revenues of ~$650M for Akebia in 2026. Our key assumptions are as follows: (1) AKB-6548 is approved as a treatment for anemia in CKD-ND and CKD-D in the US, EU, and Japan. (2) Akebia sells AKB-6548 directly in the US and collects 20% royalties on AKB-6548 sales in the EU and Japan. (3) AKB-6548 is launched in the US, EU, and Japan in 2019, 2020, and 2021 respectively. (4) Biosimilar EPO is launched in the US starting in 2015. Biosimilar EPO is priced at a 20% discount to Branded EPO. (5) AKB-6548 is priced comparably to Biosimilar EPO. (6) AKB-6548 is protected from generic competition until 2027.

The rest of the pipeline could drive further upside. Akebia plans to evaluate AKB-6548 as a treatment for idiopathic anemia of aging (IAA). Akebia plans to start enrolling the PII trial in H1'15. Topline PII data are expected to be released in H1'16. Akebia also has another HIFα stabilizer – AKB-6899 – in the pipeline. AKB-6899 appears to be differentiated from AKB-6548. Similar to AKB-6548, AKB-6899 stimulates EPO production. In addition, AKB-6899 inhibits VEGF, potentially useful for treating certain cancers and eye diseases.

Akebia (AKBA) Investment Highlights

- Biopharmaceutical company founded in 2007 and based in Cambridge, MA
- Specializes in developing hypoxia inducible factor (HIFα) stabilizing agents
- Lead pipeline compound, AKB-6548, is being developed as a potential treatment of anemia in chronic kidney disease patients on dialysis (CKD-D) and not on dialysis (CKD-ND)
  - Estimated ~5.3 million CKD patients with anemia in the US, EU, and Japan
- The market for Erythropoietin Stimulating Agents (ESAs), recombinant erythropoietin (EPO), is still substantial, generating WW sales of $4B for anemia in CKD-ND and CKD-D (were >$6B in 2006)
- AKB-6548 has potential to differentiate against ESAs by offering a more effective way to maintain/modulate hemoglobin (Hb) with better cardiovascular safety
  - Provides more "complete" red blood cell (RBC) production by improving iron metabolism and affecting other related cellular processes
- Several other companies also are developing HIFα stabilizers including Fibrogen (partnered with Astellas and AstraZeneca), GSK, and Bayer
- AKB-6548 is projected to generate peak revenues of ~$650M in 2026 based on direct sales in the US and 20% royalties on sales in the EU and Japan
- Topline PIIb data for AKB-6548 in CKD-ND due in Q4'14 is key near-term valuation inflection point
  - Provides first data on the ability of AKB-6548 to maintain Hb levels in 3 different CKD-ND patient groups (especially given the higher than recommended Hb threshold for starting treatment)
  - Offers longer term safety data on AKB-6548 in CKD-ND

Sources: Credit Suisse estimates and research

Source: Credit Suisse estimates and research

Exhibit 2: **Akebia Management and Investors**

Akebia Management and Investors

Management Team

- John Butler, President and CEO
- Robert Shalwitz, CMO
- William Daly, CBO
- Jason Amello, CFO
- Nikki Hadas, General Counsel
- Michel Dahan, VP Commercial

Investors

- Novartis Bioventures
- Venture Investors
- Satter Investment Management
- Kearny Venture Partners, LP
- Novo A/S
- Triathlon Medical Ventures

Sources: Akebia, Credit Suisse research

Source: Akebia, Credit Suisse research

Exhibit 3: **Akebia Pipeline**

Akebia Pipeline

		Target Indication(s)	Stage	Current Status	Highlights
Clinical Stage	AKB-6548 HIFα Stabilizer	▪ Anemia in CKD-ND	▪ Phase IIb	▪ Enrolling currently ▪ Topline data expected in Q4'14	▪ Major valuation driver ▪ Potentially better control of EPO levels and cardiac safety (vs. ESAs)
	AKB-6548 HIFα Stabilizer	▪ Anemia in CKD-D	▪ Phase II	▪ Plans to start multiple-dose PII trial in H1'14	▪ Major valuation driver ▪ Potentially better control of EPO levels and cardiac safety (vs. ESAs)
	AKB-6548 HIFα Stabilizer	▪ Anemia in IAA	▪ Phase I	▪ Plans to file IND for anemia in IAA in late 2014 or early 2015	▪ Literature supports use of AKB-6548 to treat anemia in IAA
Preclinical Stage	AKB-6899 HIFα Stabilizer	▪ Oncology	▪ Preclinical	▪ Evaluating potential to treat certain cancers (ovarian, breast, colon, and lung)	▪ Inhibits expression of VEGF and PGK by stimulating production sVEGFr1 ▪ Stimulates EPO production
	AKB-6899 HIFα Stabilizer	▪ Ophthalmology	▪ Preclinical	▪ Examining potential to treat certain eye diseases	▪ Inhibits expression of VEGF and PGK by stimulating production sVEGFr1 ▪ Stimulates EPO production

Sources: Akebia, Credit Suisse research

Source: Akebia, Credit Suisse research

Exhibit 4: **Anemia in Chronic Kidney Disease (CKD)**

Anemia in Chronic Kidney Disease (CKD)

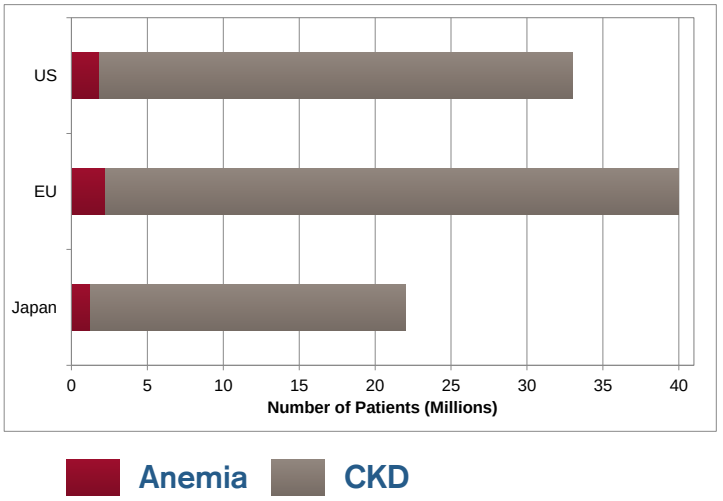
Chronic Kidney Disease Overview

- Estimated at least 95 million patients with chronic kidney disease (CKD) in the US, EU, and Japan
- Characterized by gradual decline in kidney function
- Caused by diabetes and high blood pressure (~2/3 of cases) as well as other conditions (~1/3 of cases)

Anemia in Chronic Kidney Disease Overview

- Estimated ~5.3 million CKD patients with anemia in the US, EU, and Japan
- Defined strictly as a decrease in red blood cell (RBC) mass
- Characterized by decreases in RBCs, hemoglobin (Hb) concentration, and hematocrit
- Diminishes body's ability to transport oxygen and carbon dioxide due to decreasing number of RBCs
- Defined according to Hb levels

Anemia in CKD



WHO Definition of Anemia

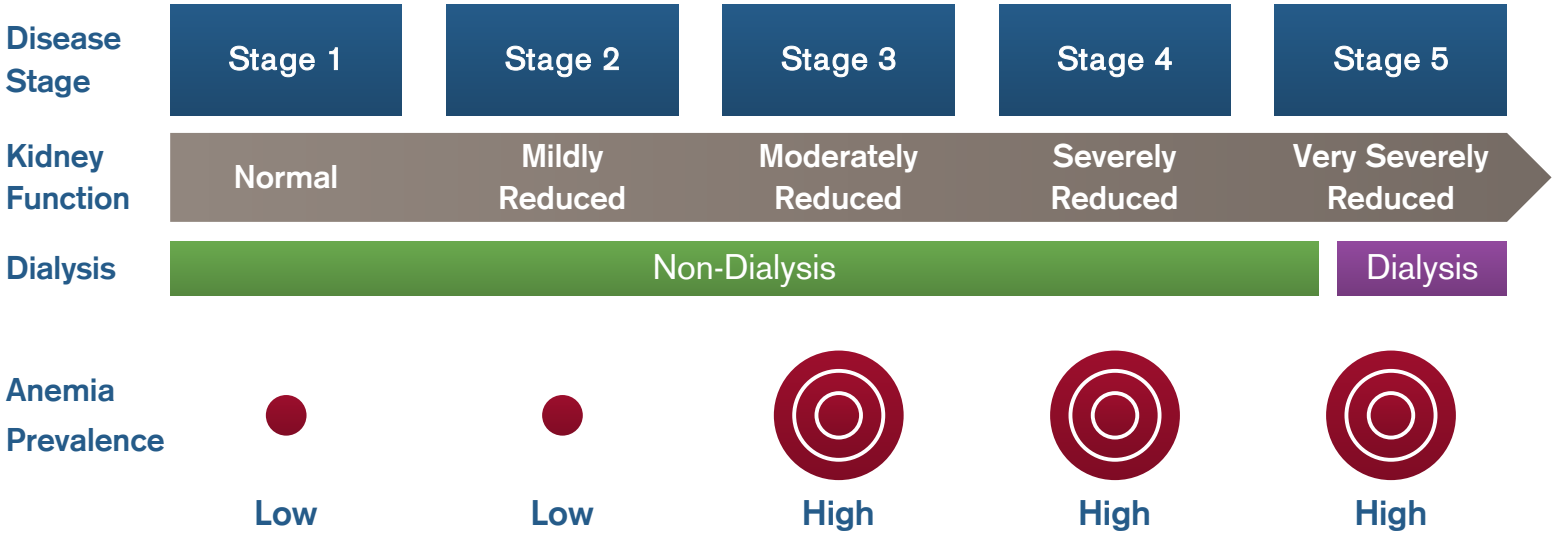
WHO Definitions	Hb Threshold
Children (0.5 – 5 years)	≤11.0g/dL
Children (5 – 12 years)	≤11.5g/dL
Teens (12- 15 years)	≤12.0g/dL
Women (>15 years)	**≤12.0g/dL**
Men (>15 years)	**≤13.0g/dL**

Sources: Akebia, ASH, EKHA, NKF, WHO, Imai et al. Clinical and Experimental Nephrology 2009, Credit Suisse estimates

Source: Akebia, ASH, EKHA, NKF, WHO, Imai et al. Clinical and Experimental Nephrology 2009, Credit Suisse estimates

Exhibit 5: **Anemia prevalence increases with CKD severity**

Anemia prevalence increases with CKD severity



- Anemia (untreated) results in chronic fatigue, increased progression of multiple diseases and death
- Increasing anemia prevalence increases as kidney function declines
- Small number of anemia cases in found in non-dialysis patients with Stage 1/2 CKD
- Majority of anemia cases found in non-dialysis patients with Stage 3/4/5 CKD and dialysis patients with Stage 5 CKD

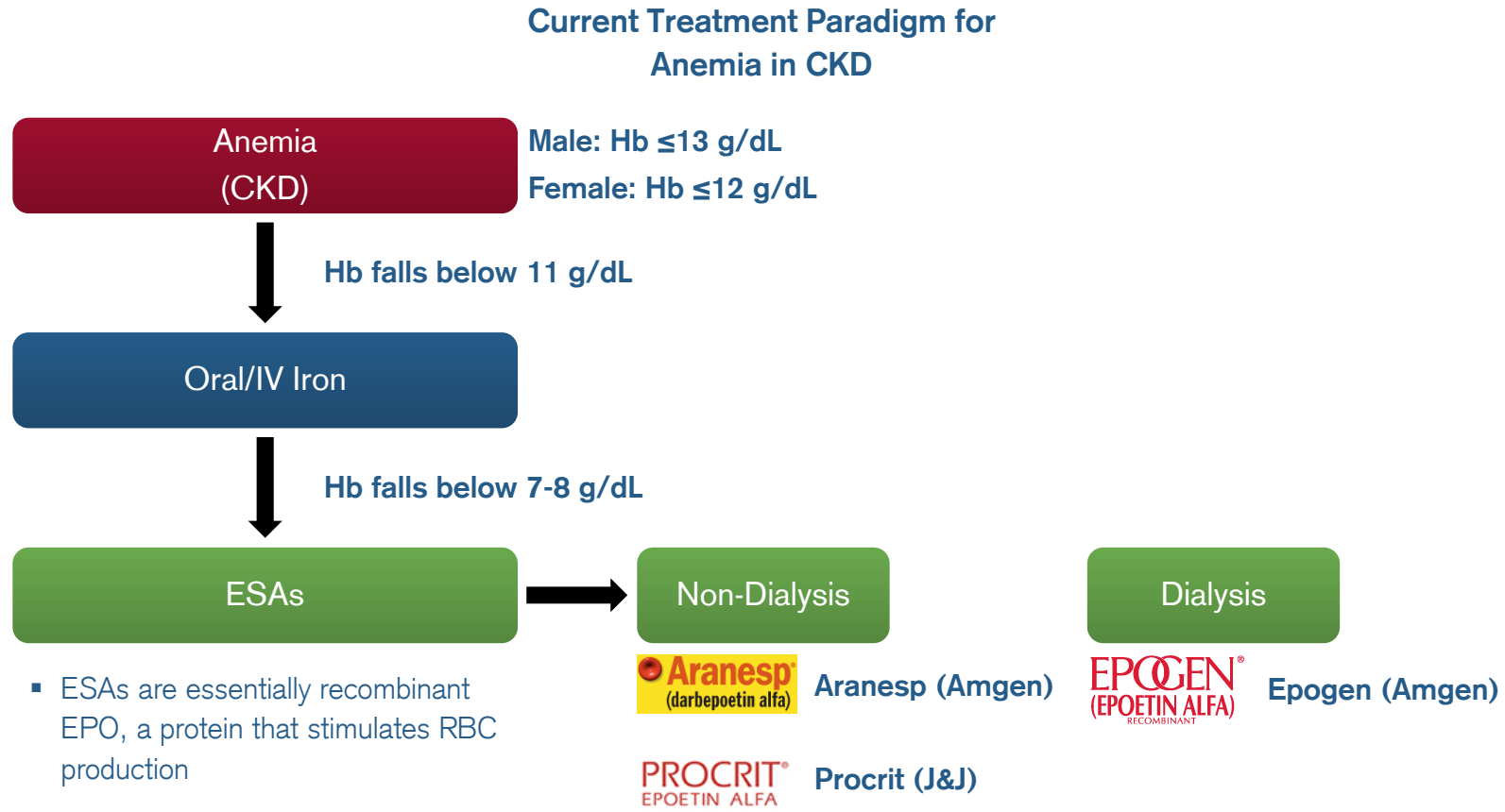
Stage 5 Chronic Kidney Disease (CKD) = End-Stage Renal Disease (ESRD); Non-Dialysis = D; Dialysis = D

Sources: Akebia, The Renal Association, Credit Suisse research

Source: Akebia, The Renal Association, Credit Suisse research

Exhibit 6: **ESAs are generally used to treat anemia when Hb falls significantly below defined thresholds**

ESAs are generally used to treat anemia when Hb falls significantly below defined thresholds



Sources: Akebia, Amgen, J&J, Credit Suisse research

Source: Akebia, Amgen, J&J, Credit Suisse research

Exhibit 7: **ESAs have been relegated to treating moderate to severe anemia in CKD mainly because of cardiovascular safety concerns**

ESAs have been relegated to treating moderate to severe anemia in CKD mainly because of cardiovascular safety concerns

- All ESAs – Aranesp, Epogen, Procrit – carry black box warnings:
  - Highlights increased risks for death, serious adverse cardiovascular reactions, and stroke when treating to target Hb levels to >11 g/dL
  - Notes lack of evidence that risks can be lowered when using different target Hb levels, dose, or dosing strategy
  - States that lowest dose should be used to reduce the need for red blood cell transfusions
- Cardiac safety concerns arose after 4 clinical trials – Normal Hematocrit, CREATE, CHOIR, and TREAT – suggested higher Hb levels correlated with worse cardiovascular outcomes
- Cardiac safety concerns led the FDA and EMA to recommend more "conservative" use of ESAs to treat anemia

Current FDA ESA Treatment Recommendations

Patient Type	Treatment Initiation	Treatment Reduction/Interruption
CKD – Not on Dialysis	▪ Hb level is less than 10 g/dL, and ▪ Hb rate of decline indicates likelihood of RBC transfusion, and ▪ Reducing risk of alloimmunization and RBC transfusion-related risks is a goal	▪ Hb level exceeds 10 g/dL ▪ Use lowest dose to reduce need for RBC transfusion
CKD – Dialysis	▪ Hb level is less than 10 g/dL	▪ Hb level exceeds 11 g/dL

Sources: Aranesp PI, Epogen PI, Procrit PI, Credit Suisse research

Source: Aranesp PI, Epogen PI, Procrit PI, Credit Suisse research

Safety data from these four major clinical trials suggest that levels of Hb increased the risk of adverse cardiovascular events

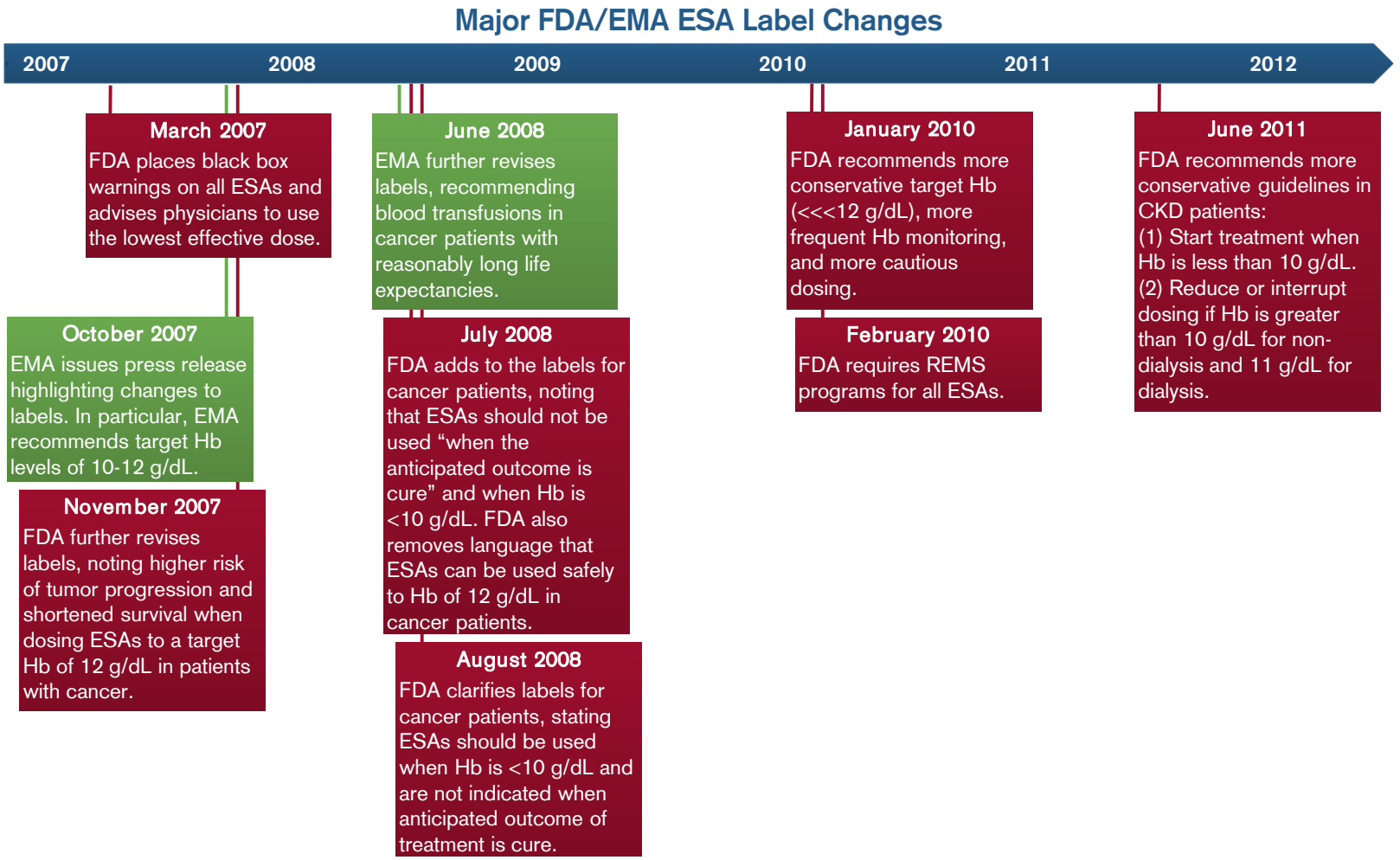
Name	Indication	Design	Comments
Normal Hematocrit	CHF–D	▪ Compared effect of treating to normal hematocrit levels (42%) relative to low hematocrit levels (30%)	▪ Stopped trial early at third interim analysis due to cardiovascular safety concerns in normal-hematocrit cohort ▪ Had higher number of deaths (183 vs. 150) and first nonfatal myocardial infarctions (19 vs. 14) for normal-hematocrit relative to low-hematocrit groups – 67% of deaths in each cohort were due to cardiovascular
CREATE	Anemia in CKD-ND	▪ Compared effect of treating immediately to reach Hb target of 13.0–15.0 g/dL relative to treating after Hb dropped to <10.5 g/dL	▪ Showed no difference in likelihood of first cardiovascular event between two arms (HR=0.78, p=0.20) ▪ Demonstrated improved general health and physical function in "immediate" treatment group (vs. "delayed" treatment group)
CHOIR	Anemia in CKD-ND	▪ Compared effect of treating to higher target Hb (13.0–13.5g/dL) relative to lower target Hb (10.5–11.0g/dL)	▪ Had higher number of composite events in high-Hb group (125) relative to low-Hb group (97) (HR=1.34, p=0.03) ▪ Showed no differences in improvements in quality of life
TREAT	Anemia in CKD with Diabetes	▪ Compared effect of treating with Aranesp relative to placebo (with rescue therapy if Hb dropped <9.0 g/dL	▪ Had a higher number of fatal or nonfatal stroke for Aranesp (101) relative to placebo (53) (HR=1.92, p<0.001). ▪ Demonstrated modest improvements in Aranesp relative to placebo

Sources: A. Besarab et al. NEJM 1998, T. Drueke et al. NEJM 2006, A. Singh et al. NEJM 2006, M. Pfeffer et al. NEJM 2009, Credit Suisse research

Source: A. Besarab et al. NEJM 1998, T. Drueke et al. NEJM 2006, A. Singh et al. NEJM 2006, M. Pfeffer et al. NEJM 2009, Credit Suisse research

Exhibit 9: **Both FDA and EMA have restricted use of ESAs due to these concerns**

Both FDA and EMA have restricted use of ESAs due to these concerns



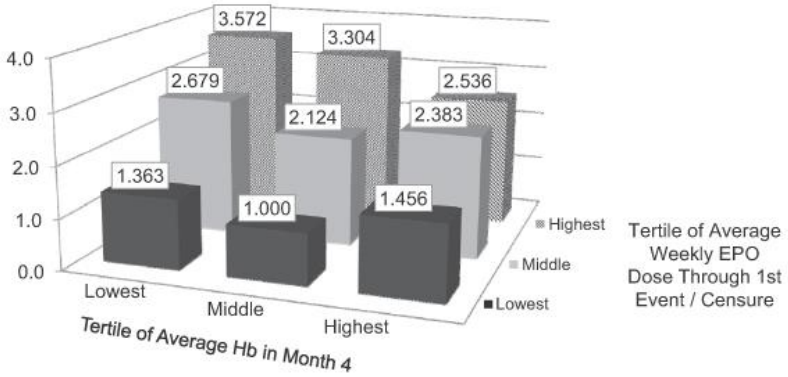
Sources: Akebia, FDA, EMA, Credit Suisse research

Source: Akebia, FDA, EMA, Credit Suisse research

Exhibit 10: **However, recent post-hoc analyses suggest that levels of EPO rather than Hb could be the cause of the cardiovascular safety issues**

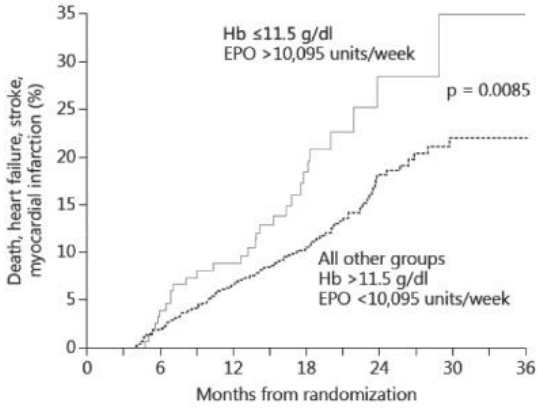
However, recent post-hoc analyses suggest that levels of EPO rather than Hb could be the cause of the cardiovascular safety issues

Cox Proportional Hazards



- Suggests that the risk of adverse cardiovascular outcomes was highest at the highest ESA dose regardless of Hb levels

Kaplan-Meier Survival Curve



- Suggests that higher levels of EPO and lower levels of Hb led to higher incidences of adverse events (heart failure, stroke, and myocardial infarction)

Sources: P. McCullough et al. AJN 2013, Credit Suisse research

Source: P. McCullough et al. AJN 2013, Credit Suisse research

Exhibit 11: **The ESA market for anemia is still substantial at ~$6.4B in 2013, despite declining from its peak of $11.6B in 2006**

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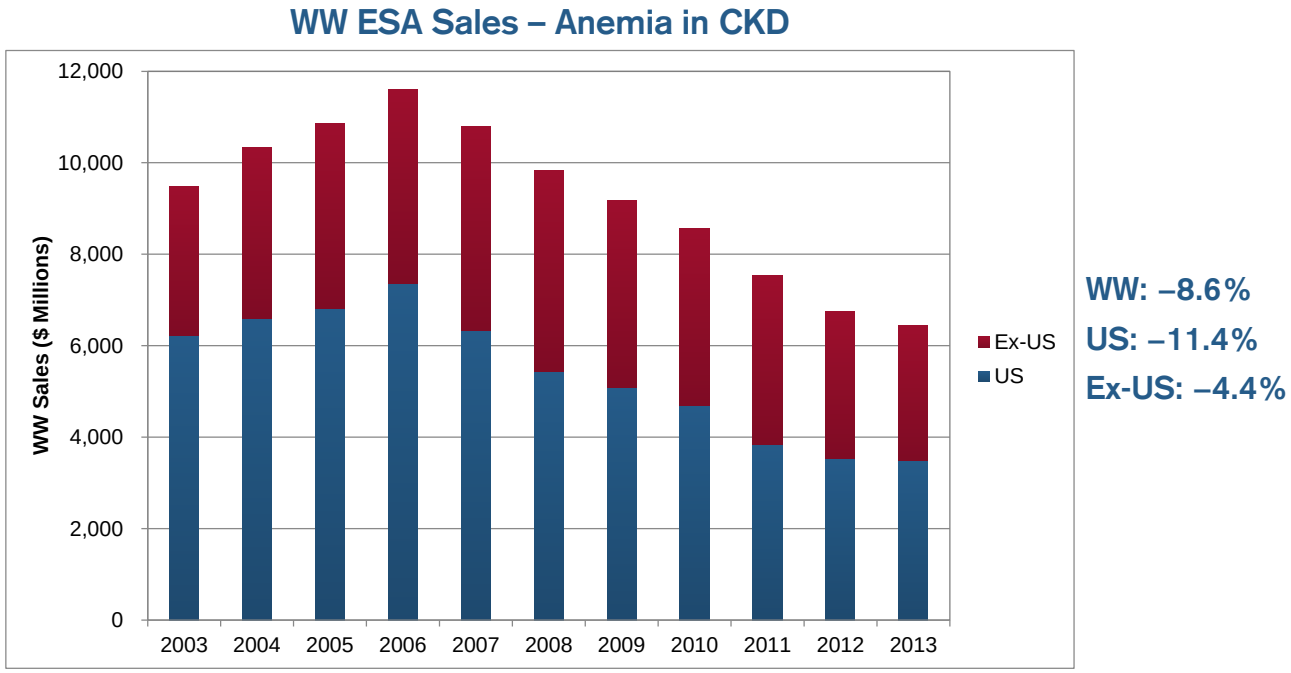


- ESA usage for anemia has decreased substantially due to more conservative treatment recommendations stemming from cardiovascular safety concerns as well as reimbursement pressure (primarily in the US)
- Sales have decreased more significantly in the US (–11.4%) than Ex-US (–4.4%)
- WW ESA sales for anemia in CKD only in 2013 were estimated to be $4.0B

Sources: Akebia, Amgen, J&J, Roche, Credit Suisse estimates

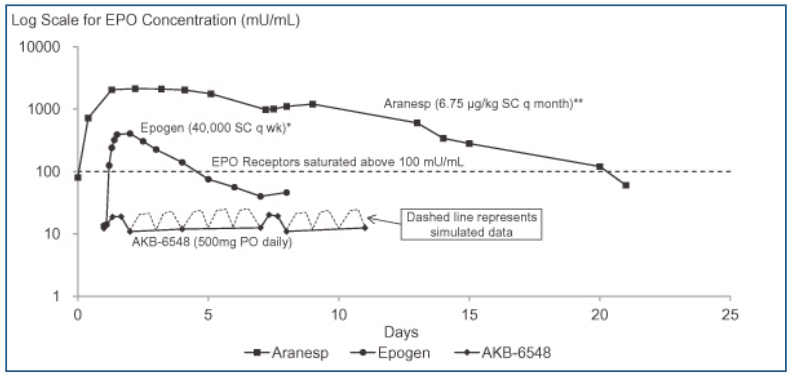
Source: Akebia, Amgen, J&J, Roche, Credit Suisse estimates

Exhibit 12: **Akebia's lead pipeline asset, AKB-6548, has the potential to improve upon the cardiac safety profile of ESAs**

Akebia's lead pipeline asset, AKB-6548, has the potential to improve upon the cardiac safety profile of ESAs

- Works via a different pathway than ESAs
  - Stabilizes HIFα by inhibiting HIF-PH, ultimately leading to an increase in production of "native" EPO (vs. directly introducing "foreign" EPO for ESAs)
- Offers more "modulatory" mechanism to stimulate RBC production relative to ESAs
  - Requires a significantly lower amount of EPO
  - Does not lead to spikes in EPO levels, which could be the cause of cardiovascular safety issues
- Provides a more "complete" RBC production process
  - Increases iron uptake
  - Affects numerous other cellular processes that are intricately involved in RBC production
- Offers potential to improve upon cardiovascular safety
  - Longer-term safety is still relatively unknown
- Offers more convenient dosing and administration
  - Given orally once-a-day
  - Provides gradual and reliable means to titrate to effective doses

EPO Concentrations – AKB-6548 vs. ESAs



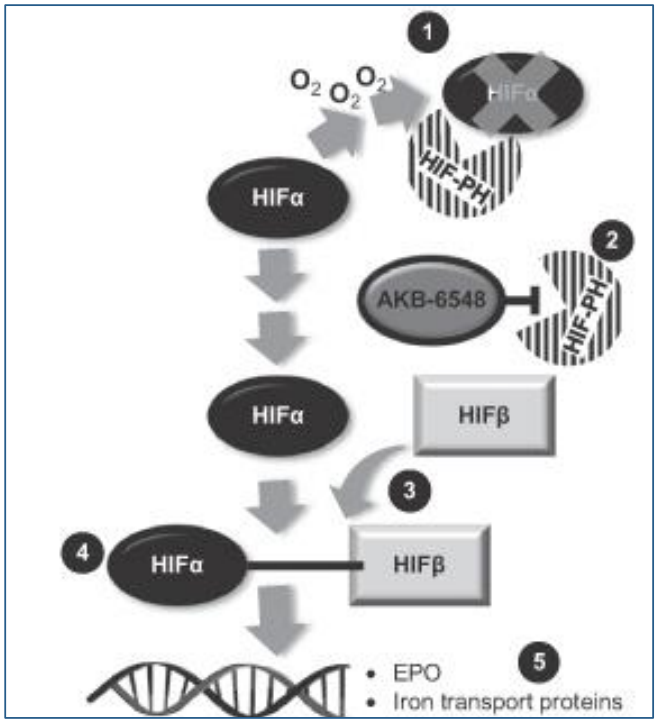
Sources: A. Arroliga et al. CCM 2009, J. Glaspy et al. EJC 2005, Akebia, Credit Suisse research

Source: A. Arroliga et al. CCM 2009, J. Glaspy et al. EJC 2005, Akebia, Credit Suisse research

Exhibit 13: **AKB-6548 increases endogenous EPO production by stabilizing HIFα**

AKB-6548 increases endogenous EPO production by stabilizing HIFα

AKB-6548 – Mechanism of Action



1. HIF-PH normally targets HIFα for destruction
2. AKB-6548 inhibits HIF-PH, leading to higher HIFα concentrations in the cytoplasm
3. HIFα binds with HIFβ in the nucleus
4. The HIFα-HIFβ complex leads increased transcription of EPO and iron transfer proteins
5. An increase in EPO and iron in the bone marrow leads to increased hemoglobin and red blood cell production

Sources: Akebia, Credit Suisse research

Source: Akebia, Credit Suisse research

Exhibit 14: **CI-0005 PIIa data suggests that AKB-6548 increases Hb levels by stimulating RBC production**

CI-0005 PIIa data suggests that AKB-6548 increases Hb levels by stimulating RBC production

- Evaluated AKB-6548 in 93 patients with Stage 3/4/5 CKD-ND
  - Enrolled for Hb ≤ 10.5g/dL (vs. Hb ≤ 10.0g/dL in ESA label treatment recommendation)
  - Dosed patients with AKB-6548 (240mg, 370mg, 500mg, 630mg) or placebo for 42 days
- Showed statistically significant, dose-dependent increases in Hb levels ranging from 0.7g/dL to 1.4g/dL (240mg, 370mg, 500mg, 630mg doses) relative to a decrease in Hb levels of 0.1 g/dL in placebo at Week 6 ($p<0.0001$)
- Maintained Hb levels below 13 g/dL on an individual patient basis throughout the trial
- Had 26% and 11% of patients in the 630mg and 500mg cohorts decrease doses per protocol due to a Hb increase of .1.5g/dL by Day 28
- Had no appreciable differences in pre-dose EPO levels for all studied doses of AKB-6548 (vs. placebo) throughout the study period
  - Suggests that AKB-6548 can improve RBC production without the need of highly elevated (non-physiological) levels of EPO in the body
- Increase in absolute reticulocyte counts precedes rise in Hb levels
  - Suggests that AKB-6548 increases Hb levels by stimulating RBC production
- Showed concomitant, dose-dependent increase in iron as measured via total iron binding capacity (TIBC)
  - Suggests that AKB-6548 provides more "complete" RBC production
  - Indicates potential for removal of iron supplementation

Sources: Akebia, Credit Suisse research

Source: Akebia, Credit Suisse research

Exhibit 15: **AKB-6548 appears to be generally safe and well-tolerated**

AKB-6548 appears to be generally safe and well-tolerated

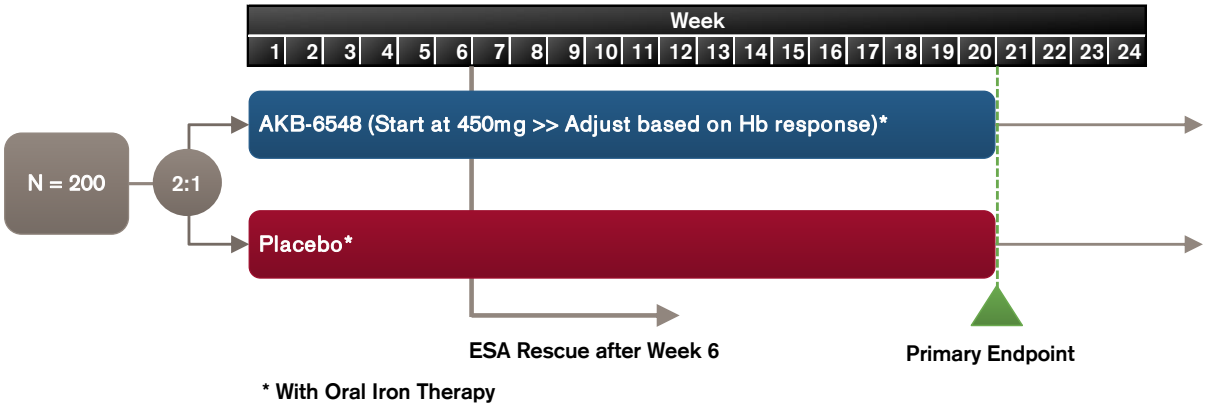
- Found no major differences in incidence of adverse events between AKB-6548 and placebo groups
  - 34 patients on AKB-6548 (47.2%) vs. 11 patients on placebo (57.9%)
  - Adverse events distributed evenly across AKB-6548 dosing groups
- Observed some drug-related adverse events
  - 10 patients on AKB-6548 (13.9%) vs. 1 patient on placebo (5.3%)
- Observed 8 serious adverse events (SAEs), of which none were attributable to AKB-6548
  - SAEs in AKB-6548 treatment groups included: gastroenteritis, hypoglycemic event, dizziness, triple vessel coronary artery disease with non-ST elevation myocardial infarction, hypertensive crisis, ventricular pacemaker lead replacement, and azotemia (uremia)
- Had 1 death in the trial, not attributed to AKB-6548
  - Patient had been hospitalized for uremia and died after developing sustained ventricular tachycardia and cardiac arrest following in-hospital procedure
  - Determined to be unrelated to AKB-6548
- Showed no statistically significant increase in VEGF, which could potentially promote tumor growth in cancers
- Demonstrated no statistically significant change between AKB-6548 and placebo cohorts with regards to inflammation (measured via C-reactive protein), renal function (measured via Cystatin-C), heart rate, blood pressure and EKG values (including QT assessments)

Sources: Akebia, Credit Suisse research

Source: Akebia, Credit Suisse research

Exhibit 16: **We see topline CI-0007 PIIb data as the key valuation-inflection catalyst**

We see topline CI-0007 PIIb data as the key valuation-inflection catalyst



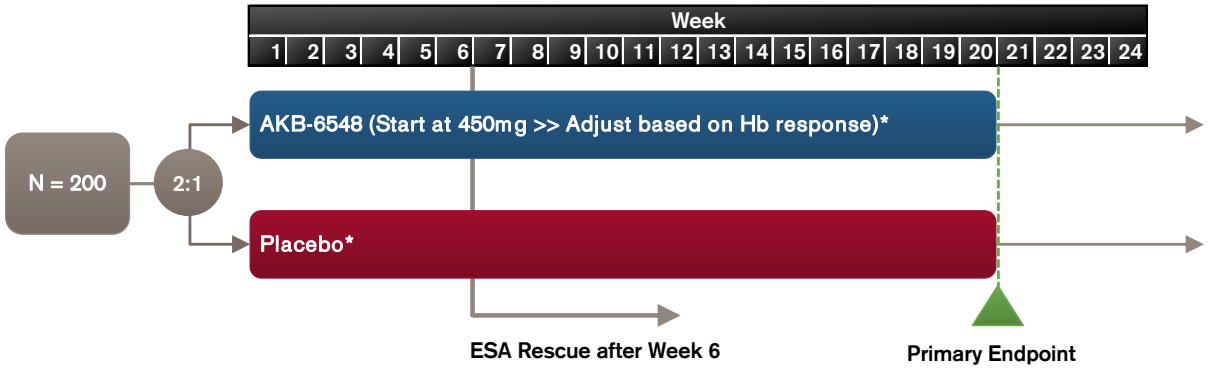
- Examines AKB-6548 as a potential treatment for anemia in CKD-ND patients
- Stratifies into 3 patient groups – naïve to ESAs (Hb ≤ 10.5g/dL), previously treated with ESAs (Hb ≤ 10.5g/dL), or actively treated with ESAs (9.5g/dL ≤ Hb ≤ 10.5g/dL)
- Provides first data on the ability of AKB-6548 to maintain Hb levels in 3 different CKD-ND patient groups (especially given the higher than recommended Hb threshold for starting treatment)
- Intends to show that an adaptive dosing approach for AKB-6548 can raise Hb without major excursions to >13.0g/dL
- Allows for optimization of dosage (including tablet size, number of tablets per dose, and dose adjustments) as well as algorithm for maintaining Hb levels within an acceptable range (likely 10.5–12.0g/dL), minimizing Hb fluctuations, and reducing frequency of excessive excursions
- Offers longer term safety data on AKB-6548 in CKD-ND
- Increases potential for Akebia to secure a partner for AKB-6548 in Ex-US

Sources: www.clinicaltrials.gov, Akebia, Credit Suisse research

Source: www.clinicaltrials.gov, Akebia, Credit Suisse research

Exhibit 17: **CI-0007 PIIb Trial Design (Anemia in CKD-ND)**

CI-0007 PIIb Trial Design (Anemia in CKD-ND)



Locations	▪ 62 US sites
Patient Population	▪ Anemia (Hb ≤ 10.5g/dL) in CKD-ND Stages 3/4/5 ▪ Stratified into 3 patient groups – naïve to ESAs (Hb ≤ 10.5g/dL), previously treated with ESAs (Hb ≤ 10.5g/dL), or actively treated with ESAs (9.5g/dL ≤ Hb ≤ 10.5g/dL)
Primary Endpoint(s)	▪ Percentage of patients who : (1) achieve or maintain a mean Hb ≥ 11.0g/dL, or (2) increase Hb ≥ 1.2g/dL over pre-dose average Hb between screening and baseline
Key Secondary Endpoint(s)	▪ Analysis of primary endpoint by Hb control, need for rescue, baseline Hb, and pre-defined groups (20 weeks) ▪ Hematologic response (20 weeks) ▪ Need for transfusion and/or ESA rescue (20 weeks) ▪ Safety (20 weeks) ▪ Iron metabolism and utilization (20 weeks) ▪ Neurocognitive and patient-reported outcomes (20 weeks) ▪ Changes in reticulocyte Hb content, HbA1c, lipids, and functional markers ▪ Concentration measurements of AKB-6548 and glucuronide metabolites (Weeks 12 and 20)
Readout	▪ Topline PII data expected in Q4'14 (Enrollment anticipated to be complete by Q2'14)
Other	▪ Counts rescues as failures. Remove non-rescues from primary analysis.

Sources: www.clinicaltrials.gov, Akebia, Credit Suisse research

Source: www.clinicaltrials.gov, Akebia, Credit Suisse research

Exhibit 18: **Projected PIII Trial Design (Anemia in CKD-ND)**

Projected PIII Trial Design (Anemia in CKD-ND)

- Plans to run 3 registration PIII trials
  - Will most likely mirror PIIb trial design
  - Intends to convince FDA/EMA to preserve ≤ 10.5g/dL threshold
  - Expects to generally use endpoints, duration, and size of PIII trials for Omontys, modified to account for lower rate of cardiac safety events given AKBA's focus on CKD-ND (vs. AFFY's focus on CKD-ND and ESRD-D)

Trial	Description	Number of Patients	Trial Duration	Average Dosing Duration	Comments
Trial #1	▪ Double-Blind ▪ Placebo-Controlled ▪ ESA Rescue	▪ 700-900	▪ 2 years	▪ 1.25 years	▪ Needs to show non-inferiority on cardiovascular safety ▪ Will likely require non-inferiority limit of 1.5-1.6 to gain approval in US
Trial #2	▪ Double-Blind ▪ Placebo-Controlled ▪ ESA Rescue	▪ 700-900	▪ 2 years	▪ 1.25 years	▪ Needs to show non-inferiority on cardiovascular safety ▪ Will likely require non-inferiority limit of 1.5-1.6 to gain approval in US
Trial #3	▪ Comparability	▪ 300	▪ 2 years	▪ 1.25 years	▪ Required for EU mainly

- Expects to run post-marketing studies as well
  - Will likely require non-inferiority limit to be lowered to 1.3
  - Gain additional quality-of-life outcome indications as well

Sources: Akebia, Credit Suisse research

Source: Akebia, Credit Suisse research

Exhibit 19: **Akebia plans to initiate a PII trial in anemia in CKD-D in H1'14**

Akebia plans to initiate a PII trial in anemia in CKD-D in H1'14

- Examines AKB-6548 as a potential treatment for anemia in CKD-D patients
- Enrolls 60 CKD-D patients in total
- Evaluates two, once-daily doses of AKB-654
  - 450mg per dose
  - 300mg per dose
- Conduct first analysis of Hb change at Week 8 and second analysis of subsequent Hb change with dose adjustment starting at Week 8
- Examines various other key secondary endpoints:
  - Safety
  - Total dose of IV iron therapy for first (Weeks 1–8) and second (Weeks 9-16) 8-week treatment set
  - Effect of dialysis on AKB-6548 pharmacokinetics
- Expects topline data readout from this trial in H1'15

Sources: Akebia, Credit Suisse research

Source: Akebia, Credit Suisse research

Exhibit 20: **Several next-generation compounds being developed as a treatment for A-CKD are HIFα stabilizers**

Several next-generation compounds being developed as a treatment for A-CKD are HIFα stabilizers

Product	Lead Company	Partner Company	Stage	Mechanism of Action	Potential Launch Year
Mircera	Roche	- - - - -	Impending Launch (A-CKD-D; US) On Market (A-CKD-D, Ex-US)	Erythropoietin	2014 (US) 2008 (Ex-US)
Epoetin Hospira	Hospira	NovaQuest	PIII (A-CKD-D, US)	Erythropoietin (Biosimilar)	2015 (US)
HX575	Novartis (Sandoz)	- - - - -	PIII (A-CKD-D, US)	Erythropoietin (Biosimilar)	2015 (US)
FG-4592 (Roxadustat)	**Fibrogen**	**AstraZeneca Astellas**	**PIII (A-CKD-ND) PIII (A-CKD-D)**	**HIFα Stabilizer**	**2017**
AKB-6548	**Akebia**	**- - - - -**	**PII (A-CKD-ND)**	**HIFα Stabilizer**	**2018/2019**
GSK-1278863	**GSK**	**- - - - -**	**PII (A-CKD-D) PII (A-CKD-ND)**	**HIFα Stabilizer**	**2018/2019**
BAY-85-3934 (Molidustat)	**Bayer**	**- - - - -**	**PII (A-CKD-ND) PII (A-CKD-D)**	**HIFα Stabilizer**	**2018/2019**

A-CKD-ND: Anemia in Chronic Kidney Disease Not On Dialysis; A-CKD-D: Anemia in Chronic Kidney Disease On Dialysis

Sources: www.clinicaltrials.gov, Akebia, BioMedTracker, Credit Suisse research

Source: www.clinicaltrials.gov, Akebia, BioMedTracker, Credit Suisse research

Exhibit 21: **Several next-generation compounds being developed as a treatment for A-CKD are HIFα stabilizers (continued)**

Several next-generation compounds being developed as a treatment for A-CKD are HIFα stabilizers (continued)

Product	Lead Company	Partner Company	Stage	Mechanism of Action	Potential Launch Year
PBI-1402	**ProMetic**	**- - - - -**	**PII**	**HIFα Stabilizer**	**2020+**
ACE-011 (Sotatercept)	Acceleron	Celgene	PII (A-CKD-D)	TGF-Beta, Activin	2018/2019
NOX-H94	NOXXON	- - - - -	PII	Hepcidin Antagonist	2020+
LY2928057	Eli Lilly	- - - - -	PI	Hepcidin Antagonist	2020+
DS-1093	**Daiichi Sankyo**	**- - - - -**	**PI**	**HIFα Stabilizer**	**2020+**
HM-10760A	Hanmi	- - - - -	PI	Erythropoietin	2020+
JTZ-951	**Japan Tobacco**	**- - - - -**	**PI**	**HIFα Stabilizer**	**2020+**

A-CKD-ND: Anemia in Chronic Kidney Disease Not On Dialysis; A-CKD-D: Anemia in Chronic Kidney Disease On Dialysis

Sources: www.clinicaltrials.gov, Akebia, BioMedTracker, Credit Suisse research

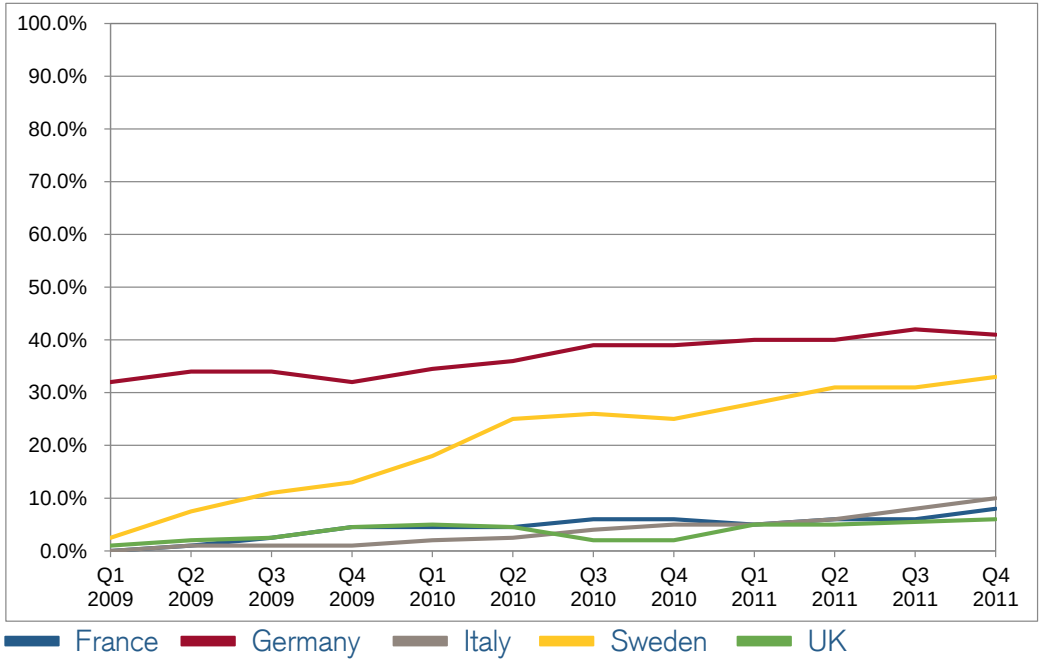
Source: www.clinicaltrials.gov, Akebia, BioMedTracker, Credit Suisse research

Exhibit 22: **To what extent will Biosimilar ESAs be adopted in the US?**

To what extent will Biosimilar ESAs be adopted in the US?

- Adopted at low rates in France, Italy, and UK, but at high rates in Germany and Sweden
- Highly variable healthcare systems across these countries
- Experience in Germany and Sweden could serve as a model for what may happen in the US due to these similarities among healthcare systems:
  - Relatively high prices for innovative products
  - History of generic utilization
  - Decentralized approach to drug utilization and reimbursement

ESA Biosimilar Share (by Daily Dose) in Select EU Countries



	France	Germany	Italy	Sweden	UK
High Generic Use	No	Yes	No	Yes	Yes
Quotas	No	Yes	Yes	No	No
Reference Price System	No	Yes	No	No	No
Price Relative to Brand	Fixed	Variable	Fixed	Variable	Variable
Patient Co-Pays	Mixed	Capped	Mixed	Capped	No

Sources: H. Grabowski et al. Nature Biotechnology 2014, IMS, Credit Suisse research

Source: H. Grabowski et al. Nature Biotechnology 2014, IMS, Credit Suisse research

Exhibit 23: **Comparison of Next-Gen Compounds for Anemia in CKD-ND**

Comparison of Next-Gen Compounds for Anemia in CKD-ND

	AKB-6548	FG-4592 (Roxadustat)	GSK-1278863	BAY-85-3934
Trial Name	▪ CI-0005	▪ FGCL-4592-041	▪ PHI116581	▪ - - - - -
Trial Stage	▪ Phase IIa	▪ Phase IIb	▪ Phase IIa	▪ Phase I
Number of Patients	▪ 93	▪ 95	▪ 73	▪ - - - - -
Patient Population	▪ Stage 3/4/5 CKD-ND	▪ Stage 3/4 CKD-ND	▪ Stage 3/4/5 CKD-ND	▪ Healthy Volunteers
Studied Dose(s)	▪ 240mg QD to 630mg QD	▪ 50mg to 140mg BIW/TIW	▪ 0.5mg to 5.0mg QD	▪ 5.0mg to 50.0mg QD
Treatment Duration	▪ 6 weeks	▪ 24 weeks	▪ 4 weeks	▪ - - - - -
Efficacy	▪ Showed dose-dependent rises in Hb (0.7g/dL to 1.4g/dL vs. –0.1g/dL for pbo) coupled with increases in reticulocytes and RBCs at Week 6 ▪ Demonstrated no appreciable differences in EPO levels ▪ Could improve iron metabolism by decreasing hepcidin and increasing TIBC	▪ Showed increases in Hb of 0.6g/dL to 1.6 g/dL at Week 4 across 4 cohorts using different dosing algorithms ▪ Could improve iron metabolism by decreasing hepcidin and increasing TIBC	▪ Showed dose-dependent rises in Hb (–0.1g/dL to +1.0g/dL vs. –0.2g/dL for pbo) accompanied by increases in reticulocytes, RBCs, and hematocrit at Week 4 ▪ Showed dose-dependent increase in peak EPO ▪ Could improve iron metabolism by decreasing hepcidin and increasing TIBC	▪ Showed significant rises in reticulocytes at ≥37.5mg doses ▪ Showed significant rises in EPO at ≥12.5mg doses
Safety/Tolerability	▪ Observed 8 SAEs, of which none were attributable to AKB-6548 ▪ Had 1 death in the trial, not attributed to AKB-6548	▪ Reduced mean arterial pressure, total cholesterol, and platelet counts ▪ Lowered incidence of hypertension	▪ Observed 4 SAEs in 3 patients possibly attributable to GSK-1278863 – Had hypoglycemia, acute pancreatitis, and acute renal failure at 2.0mg QD as well as azotaemia at 5.0mg QD	▪ Observed no prohibitive safety findings

Sources: Akebia, Bayer, Fibrogen, GSK, Credit Suisse research

Source: Akebia, Bayer, Fibrogen, GSK, Credit Suisse research

Exhibit 24: **Akebia DCF Valuation**

Akebia DCF Valuation

AKBA Valuation *(In $ '000s)*	2015E	2016E	2017E	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E
FCFE	8,497	40,736	(47,179)	(36,305)	(48,352)	(11,094)	66,711	128,356	179,233	250,613	320,779	343,431	217,583
PV of FCFE	**8,025**	**34,974**	**(28,608)**	**5,700**	**2,623**	**26,692**	**67,252**	**87,647**	**99,402**	**119,326**	**134,371**	**129,973**	**76,584**

Total PV of FCFE	763,963
Net Cash	113,904
Shares Out	20,209
Price/Share	**$24.54**
Cash/Share	**$5.64**
Risk Weighting	***50.0%***

Valuation Methodology

- Our DCF-derived target price of $25 assumes cash flows generated from AKB-6548 until 2027, 50% risk-weighting, 10% discount rate, and no terminal value.

AKB-6548 – Key Modeling Assumptions

- AKB-6548 approved as treatment for anemia in CKD-ND and CKD-D in the US, EU, and Japan
- 50% probability of success
- Achieves total peak revenues (AKB-6548 sales and royalties) of ~$650M in 2026
- Sells AKB-6548 directly in the US and collects 20% royalties on AKB-6548 sales in EU and Japan
- Launches AKB-6548 in the US, EU, and Japan in 2019, 2020, and 2021 respectively
- Includes upfront payments related to partnering of $80M and $40M in the EU and Japan respectively
- Includes regulatory milestones of $33M for the EU and $20M in Japan
- Accounts for Biosimilar EPO impact in the US starting in 2015
- Protected from generic competition until 2027

Sources: Akebia, Credit Suisse estimates

Source: Akebia, Credit Suisse estimates

Exhibit 25: **Risk Factors**

Risk Factors

- **AKB-6548 is not approved or significantly delayed.**
  - Akebia is heavily dependent on the success of their lead compound, AKB-6548. If Akebia fails to obtain regulatory approval for AKB-6548, then its business could be materially harmed. Under this scenario, AKBA may be valued at cash per share of $6.
- **AKB-6548 does not demonstrate efficacy and/or safety expected from data on studies to date.**
  - Our assumptions are based on expectations regarding AKB-6548's efficacy and/or safety. If AKB-6548 is shown to be less efficacious and/or safe than is expected, then our sales estimates for AKB-6548 could fall short of our expectations.
- **AKB-6548 could underperform our expectations for the product launch ramp and/or peak sales.**
  - In modeling AKB-6548, we have developed a patient-driven model to attempt to forecast the launch trajectory and peak sales. However, if any of the following parameters (i.e. pricing, treatment rate, average duration of therapy, competitive landscape) are worse than our expectations, then our sales estimates for AKB-6548 could be too high.
- **Anemia in CKD market may not become as large as expected**
  - We currently have projected a particular size of the Anemia in CKD market based on a patient-driven model. If the number of projected patients seeking treatment is lower than projected, then the total Anemia in CKD market could be significantly lower than forecast.

Sources: Credit Suisse research

Source: Credit Suisse estimates

Exhibit 26: **Akebia Quarterly Income Statement**

Akebia Quarterly Income Statement

Akebia Quarterly Income Statement					
($ in '000s except per share and per-share amounts)	**Q1'14E**	**Q2'14E**	**Q3'14E**	**Q4'14E**	**2014E**
AKB-6548 (US Direct Sales)	0	0	0	0	0
AKB-6548 Royalty (EU + Japan)	0	0	0	0	0
AKB-6548 Milestones	0	0	0	0	0
Total Revenues	**0**	**0**	**0**	**0**	**0**
Cost of Goods Sold	0	0	0	0	0
Gross Profit	**0**	**0**	**0**	**0**	**0**
Research & Development	4,033	4,635	5,327	6,193	20,188
Selling, General, & Administrative	1,592	1,671	1,755	2,792	7,810
Total Operating Expenses	5,625	6,306	7,082	8,986	27,999
Operating Income/(Loss)	**(5,625)**	**(6,306)**	**(7,082)**	**(8,986)**	**(27,999)**
Other Income/(Expense)	75	75	75	75	300
Pre-Tax Income/(Loss)	**(5,550)**	**(6,231)**	**(7,007)**	**(8,911)**	**(27,699)**
Provision/(Benefit) for Income Tax	0	0	0	0	0
Effective Tax Rate	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
Net Income/(Loss)	**(5,550)**	**(6,231)**	**(7,007)**	**(8,911)**	**(27,699)**
Basic EPS	**($0.38)**	**($0.31)**	**($0.35)**	**($0.44)**	**($1.48)**
Diluted EPS	**($0.38)**	**($0.31)**	**($0.35)**	**($0.44)**	**($1.48)**
Basic Shares	14,530	20,124	20,144	20,164	18,741
Diluted Shares	14,530	20,124	20,144	20,164	18,741

Sources: Akebia, Credit Suisse estimates

Source: Akebia, Credit Suisse estimates

Exhibit 27: **Akebia Annual Income Statement**

Akebia Annual Income Statement

Akebia Annual Income Statement													
($ in '000s except per share and per-share amounts)	**2012A**	**2013E**	**2014E**	**2015E**	**2016E**	**2017E**	**2018E**	**2019E**	**2020E**	**2021E**	**2022E**	**2023E**	**2024E**
AKB-6548 (US Direct Sales)	0	0	0	0	0	0	0	34,000	117,016	202,795	277,584	355,128	430,568
AKB-6548 Royalty (EU + Japan)	0	0	0	0	0	0	0	0	2,507	13,802	32,759	53,417	72,976
AKB-6548 Milestones	0	0	0	40,000	80,000	0	20,000	12,000	12,500	7,500	0	0	0
Total Revenues	**0**	**0**	**0**	**40,000**	**80,000**	**0**	**20,000**	**46,000**	**132,023**	**224,096**	**310,343**	**408,545**	**503,545**
Cost of Goods Sold	0	0	0	0	0	0	0	3,400	11,702	20,279	27,758	35,513	43,057
Gross Profit	**0**	**0**	**0**	**40,000**	**80,000**	**0**	**20,000**	**42,600**	**120,321**	**203,817**	**282,585**	**373,032**	**460,488**
Research & Development	5,632	10,782	20,188	27,233	34,810	42,417	49,582	55,500	59,921	62,907	64,165	65,448	66,757
Selling, General, & Administrative	2,891	5,152	7,810	9,019	9,649	9,959	15,473	32,800	43,721	51,678	56,489	59,177	60,360
Total Operating Expenses	8,523	15,933	27,999	36,252	44,458	52,377	65,054	88,300	103,641	114,585	120,654	124,625	127,118
Operating Income/(Loss)	**(8,523)**	**(15,933)**	**(27,999)**	**3,748**	**35,542**	**(52,377)**	**(45,054)**	**(45,700)**	**16,680**	**89,232**	**161,931**	**248,407**	**333,370**
Other Income/(Expense)	327	2,766	300	300	300	300	300	300	300	300	300	300	300
Pre-Tax Income/(Loss)	**(8,196)**	**(13,167)**	**(27,699)**	**4,048**	**35,842**	**(52,077)**	**(44,754)**	**(45,400)**	**16,980**	**89,532**	**162,231**	**248,707**	**333,670**
Provision/(Benefit) for Income Tax	0	0	0	0	0	0	0	0	0	0	21,771	62,177	83,418
Effective Tax Rate	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*13.4%*	*25.0%*	*25.0%*
Net Income/(Loss)	**(8,196)**	**(13,167)**	**(27,699)**	**4,048**	**35,842**	**(52,077)**	**(44,754)**	**(45,400)**	**16,980**	**89,532**	**140,460**	**186,530**	**250,253**
Basic EPS			**($1.48)**	**$0.18**	**$1.50**	**($1.91)**	**($1.46)**	**($1.47)**	**$0.55**	**$2.87**	**$4.46**	**$5.87**	**$7.80**
Diluted EPS			**($1.48)**	**$0.17**	**$1.49**	**($1.91)**	**($1.46)**	**($1.47)**	**$0.54**	**$2.84**	**$4.41**	**$5.81**	**$7.72**
Basic Shares			18,741	22,033	23,907	27,256	30,633	30,801	30,999	31,231	31,491	31,766	32,066
Diluted Shares			18,741	23,927	24,041	27,256	30,633	30,801	31,273	31,542	31,816	32,093	32,423

Sources: Akebia, Credit Suisse estimates

Source: Akebia, Credit Suisse estimates

Exhibit 28: **Akebia Balance Sheet**

Akebia Balance Sheet

Akebia Balance Sheet													
($ in '000s except per share and per-share amounts)	**2012A**	**2013E**	**2014E**	**2015E**	**2016E**	**2017E**	**2018E**	**2019E**	**2020E**	**2021E**	**2022E**	**2023E**	**2024E**
Cash & Cash Equivalents	1,641	21,215	105,663	193,467	238,605	341,849	306,178	258,731	248,918	317,418	448,092	630,219	884,787
Investments	0	11,341	8,241	4,120	0	0	0	0	0	0	0	0	0
Accounts Receivable	86	135	160	175	185	195	0	10,200	32,764	52,727	66,620	78,128	86,114
Inventory	0	0	0	0	0	0	0	4,080	12,872	20,888	26,648	31,606	35,307
Prepaid Expenses and Other Current Assets	517	739	850	950	1,000	1,050	4,800	5,520	13,862	20,169	23,276	24,513	22,660
Total Current Assets	2,244	33,431	114,914	198,712	239,790	343,094	310,978	278,531	308,417	411,202	564,636	764,466	1,028,867
Equipment, Net of Accumulated Depreciation	0	30	122	301	468	812	1,227	1,848	2,429	2,973	3,481	3,956	4,400
Deferred Offering Costs	0	1,078	1,078	1,078	1,078	1,078	1,078	1,078	1,078	1,078	1,078	1,078	1,078
Other Assets	0	125	125	125	125	125	125	125	125	125	125	125	125
Total Assets	**2,244**	**34,665**	**116,239**	**200,217**	**241,462**	**345,110**	**313,408**	**281,583**	**312,049**	**415,378**	**569,320**	**769,625**	**1,034,470**
Accounts Payable	418	714	0	0	0	0	6,505	8,477	9,535	10,083	10,135	9,970	9,661
Accrued Expenses	351	3,184	3,080	3,988	4,890	5,761	7,156	13,245	19,692	26,354	32,577	38,634	44,491
Current Portion of Capital Lease Obligation	0	4	4	4	4	4	4	4	4	4	4	4	4
2012 Series X Preferred Stock	4,154	0	0	0	0	0	0	0	0	0	0	0	0
Total Current Liabilities	4,923	3,902	3,084	3,992	4,894	5,765	13,665	21,726	29,231	36,442	42,715	48,608	54,156
Capital Lease Obligation, Net of Current Portion	0	8	8	8	8	8	8	8	8	8	8	8	8
Total Liabilities	**4,923**	**3,910**	**3,092**	**4,000**	**4,902**	**5,773**	**13,673**	**21,734**	**29,239**	**36,450**	**42,723**	**48,616**	**54,164**
Series A Redeemable Convertible Preferred Stock	37,092	0	0	0	0	0	0	0	0	0	0	0	0
Series B Redeemable Convertible Preferred Stock	19,816	0	0	0	0	0	0	0	0	0	0	0	0
Series C Redeemable Convertible Preferred Stock	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Redeemable Convertible Preferred Stock	56,909	0	0	0	0	0	0	0	0	0	0	0	0
Common Stock	0	0	7	11	11	17	17	18	18	18	18	19	19
Additional Paid-In-Capital	0	94,462	204,546	283,564	288,064	442,912	448,065	453,579	459,560	466,145	473,353	481,236	490,279
Accumulated Surplus/(Deficit)	(59,588)	(63,707)	(91,405)	(87,357)	(51,516)	(103,593)	(148,347)	(193,747)	(176,767)	(87,235)	53,225	239,755	490,008
Total Stockholders' Equity	(59,588)	30,755	113,147	196,217	236,559	339,336	299,735	259,849	282,811	378,928	526,596	721,010	980,306
Total Liabilities & Stockholders' Equity	**2,244**	**34,665**	**116,239**	**200,217**	**241,462**	**345,110**	**313,408**	**281,583**	**312,049**	**415,378**	**569,320**	**769,625**	**1,034,470**

Sources: Akebia, Credit Suisse estimates

Source: Akebia, Credit Suisse estimates

Exhibit 29: **Akebia Cash Flow Statement**

Akebia Cash Flow Statement

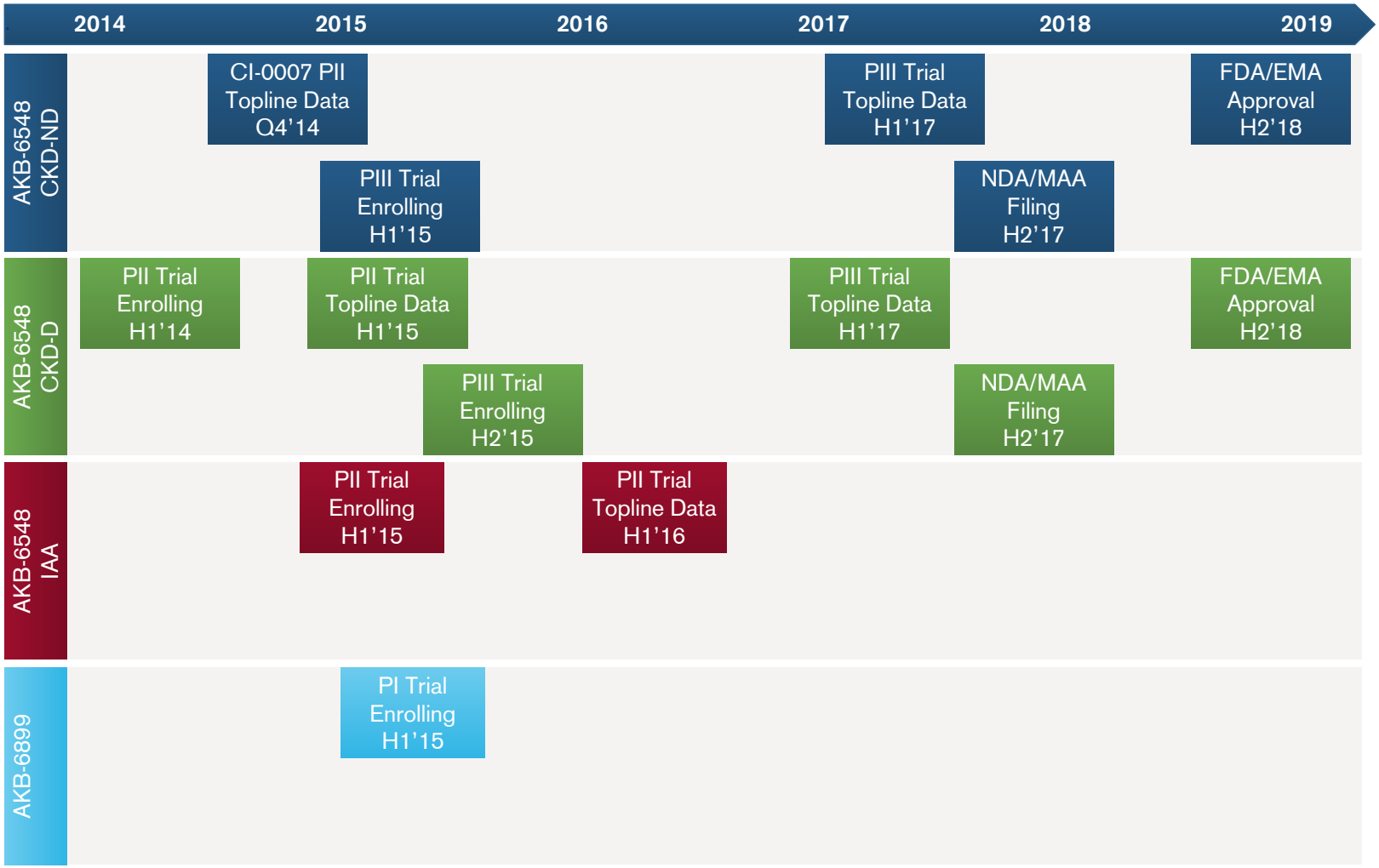
Akebia Cash Flow Statement													
($ in '000s except per share and per-share amounts)	**2012A**	**2013E**	**2014E**	**2015E**	**2016E**	**2017E**	**2018E**	**2019E**	**2020E**	**2021E**	**2022E**	**2023E**	**2024E**
OPERATING ACTIVITIES													
Net Income/(Loss)	(8,196)	(13,167)	(27,699)	4,048	35,842	(52,077)	(44,754)	(45,400)	16,980	89,532	140,460	186,530	250,253
Adjustments:													
Gain on Extinguishment of Debt and Other Liabilities	0	(2,420)	0	0	0	0	0	0	0	0	0	0	0
Depreciation	0	1	8	21	33	56	85	128	169	207	242	275	306
Amortization of Debt Issuance Costs	17	9	0	0	0	0	0	0	0	0	0	0	0
Amortization of Debt Discount and Interest Expense	1,654	752	0	0	0	0	0	0	0	0	0	0	0
Gain on Cancellation of Preferred Stock Future Tranche Rights	0	0	0	0	0	0	0	0	0	0	0	0	0
Issuance of 2007 Series X Preferred Stock for Licensing Agreement	0	0	0	0	0	0	0	0	0	0	0	0	0
Stock-Based Compensation	122	1,564	3,069	3,836	4,219	4,430	4,519	4,609	4,701	4,795	4,891	4,989	5,089
Changes in Operating Asses and Liabilities:			0	0	0	0	0	0	0	0	0	0	0
Accounts Receivable	(4)	(50)	(25)	(15)	(10)	(10)	195	(10,200)	(22,565)	(19,962)	(13,894)	(11,508)	(7,985)
Inventory	0	0	0	0	0	0	0	(4,080)	(8,792)	(8,016)	(5,760)	(4,958)	(3,700)
Prepaid Expenses and Other Current Assets	244	(167)	(111)	(100)	(50)	(50)	(3,750)	(720)	(8,342)	(6,306)	(3,107)	(1,237)	1,853
Other Assets	0	(125)	0	0	0	0	0	0	0	0	0	0	0
Accounts Payable	(1,048)	2,272	(714)	0	0	0	6,505	1,971	1,058	548	51	(165)	(309)
Accrued Expenses	0	0	(104)	908	903	871	1,395	6,089	6,447	6,663	6,222	6,057	5,857
Cash Flows from Operating Activities	**(7,211)**	**(11,332)**	**(25,575)**	**8,697**	**40,936**	**(46,779)**	**(35,805)**	**(47,602)**	**(10,344)**	**67,461**	**129,106**	**179,983**	**251,363**
INVESTING ACTIVITIES													
Purchases of Property and Equipment	0	(20)	(100)	(200)	(200)	(400)	(500)	(750)	(750)	(750)	(750)	(750)	(750)
Proceeds from Maturities of Short-Term Investments	0	1,990	3,100	4,120	4,120	0	0	0	0	0	0	0	0
Proceeds from Sale of Short-Term Investments	1,366	0	0	0	0	0	0	0	0	0	0	0	0
Purchases of Short-Term Investments	0	(13,395)	0	0	0	0	0	0	0	0	0	0	0
Cash Flows from Investing Activities	**1,366**	**(11,425)**	**3,000**	**3,920**	**3,920**	**(400)**	**(500)**	**(750)**	**(750)**	**(750)**	**(750)**	**(750)**	**(750)**
FINANCING ACTIVITIES													
Proceeds from Issuance of Preferred Stock	0	41,240	0	0	0	0	0	0	0	0	0	0	0
Preferred Stock Issuance Costs	0	(1,194)	0	0	0	0	0	0	0	0	0	0	0
Debt Issuance Costs	(25)	0	0	0	0	0	0	0	0	0	0	0	0
IPO Issuance Costs	0	(221)	0	0	0	0	0	0	0	0	0	0	0
Proceeds from Issuance of 2012 Series X Preferred Stock	2,500	2,500	0	0	0	0	0	0	0	0	0	0	0
Proceeds from Issuance of Common Stock	0	5	106,900	75,000	0	150,000	0	0	0	0	0	0	0
Proceeds from Share-Based Compensation	0	0	122	186	282	424	634	905	1,280	1,790	2,317	2,894	3,955
Proceeds from Issuance of Convertible Debt	0	0	0	0	0	0	0	0	0	0	0	0	0
Cash Flows from Financing Activities	**2,475**	**42,331**	**107,022**	**75,186**	**282**	**150,424**	**634**	**905**	**1,280**	**1,790**	**2,317**	**2,894**	**3,955**
Increase/(Decrease) in Cash and Cash Equivalents	**(3,370)**	**19,574**	**84,448**	**87,804**	**45,138**	**103,245**	**(35,671)**	**(47,447)**	**(9,813)**	**68,500**	**130,673**	**182,127**	**254,568**

Sources: Akebia, Credit Suisse estimates

Source: Akebia, Credit Suisse estimates

Exhibit 30: **Akebia Key Upcoming Catalysts**

Akebia Key Upcoming Catalysts



Sources: Akebia, Credit Suisse research

Source: Akebia, Credit Suisse research

Exhibit 31: **Appendix – FG-4592 (Roxadustat) – PIII Development Program**

FG-4592 (Roxadustat) – PIII Development Program

Trial	Size (N)	Arms	Indication	Treatment Duration	Key Entry Criteria	Primary Endpoint(s)	Data Readout
ALPS (EU)	600	▪ FG-4592 TIW*/QW** ▪ FG-4592 TIW*/BIW** ▪ FG-4592 TIW*/TIW** ▪ Placebo TIW*/QW** ▪ Placebo TIW*/BIW** ▪ Placebo TIW*/TIW**	Anemia in Stage 3/4/5 CKD-ND	52–104 weeks	▪ Hb ≤ 10.0 g/dL ▪ Weight: 45–160 kg ▪ ALT/AST: ≤ 3x ULN ▪ TBL: ≤ 1.5x ULN	▪ Hb response through 24 weeks	2016
DOLOMITES (EU)	570	▪ FG-4592 TIW*/TIW** ▪ FG-4592 TIW*/BIW** ▪ FG-4592 TIW*/QW** ▪ Aranesp	Anemia in Stage 3/4/5 CKD-ND	104 weeks	▪ Hb: ≤ 10.0 g/dL ▪ Weight: 45–160 kg ▪ ALT/AST: ≤ 3x ULN ▪ TBL: ≤ 1.5x ULN	▪ Hb response without ESA rescue through 24 weeks	2017
PYRENEES (EU)	- - - - -	- - - - -	- - - - -	- - - - -	▪ - - - - -	▪ - - - - -	- - - - -

(FG-4592 doses will be adjusted during the study period)

AST: Alanine Aminotransferase; AST: Aspartate Aminotransferase; ULN: Upper Limit of Normal; TBL: Total Bilirubin

*Correction Period

**Maintenance Period

Sources: www.clinicaltrials.gov, Fibrogen, Credit Suisse research

Source: www.clinicaltrials.gov, Fibrogen, Credit Suisse research

FG-4592 (Roxadustat) – PIII Development Program (continued)

Trial	Size (N)	Arms	Indication	Treatment Duration	Key Entry Criteria	Primary Endpoint(s)	Data Readout
Study '060 (Global) 2:1R****	450–600	1) FG-4592 TIW*/BIW** 2) FG-4592 TIW*/TIW** 3) FG-4592 TIW*/QW** 4) Placebo TIW*/BIW** 5) Placebo TIW*/BIW** 6) Placebo TIW*/QW**	Anemia in Stage 3/4/5 CKD-ND	52 weeks	▪ Hb: Not Specified ▪ Weight: 45–160 kg	▪ Anemia correction through 24 weeks ▪ Hb response as defined by protocol	2016
HIMALAYAS (Global) 1:1R*****	750	1) FG-4592 TIW*** 2) Epogen/Procrit	Anemia in Stage 5 CKD-D (ESA-N)	52–156 weeks	▪ Hb: Not Specified ▪ Weight: 45–160 kg	▪ Hb response through 24 weeks (% patients with Hb ≥ 11 g/dL and rise ≥ 1 g/dL)	2016

(FG-4592 doses will be adjusted during the study period)

AST: Alanine Aminotransferase; AST: Aspartate Aminotransferase; ULN: Upper Limit of Normal; TBL: Total Bilirubin; ESA-N: ESA Naïve

*Correction Period

**Maintenance Period

***Start initial dose based on weight. Adjust dose based Hb values and rate of change compared to previous Hb thereafter

****2:1R: 2 to 1 randomization

*****1:1R: 1 to 1 randomization

Sources: www.clinicaltrials.gov, Fibrogen, Credit Suisse research

Source: www.clinicaltrials.gov, Fibrogen, Credit Suisse research

Exhibit 33: **Appendix – Summary of Deal Terms for Fibrogen's HIFα Stabilizers**

Summary of Deal Terms for Fibrogen's HIFα Stabilizers

Date	Companies	Product(s)	Indication(s)	Region(s)	Deal Terms
7/31/2013	Fibrogen AstraZeneca	FG-4592	Anemia (CKD-ND) Anemia (CKD-D) Others	US China	▪ **Upfront:** Fibrogen receives upfront and subsequent non-contingent payments totaling $350M. ▪ **Milestones:** Fibrogen could receive (1) development-related milestones of ≤$465M, (2) sales-related milestones, and (3) tiered royalty payments on future sales of FG-4592 in the low 20% range. Fibrogen also could receive additional milestones for any other subsequent indications. ▪ **Commercialization: (1) US:** AstraZeneca commercializes. Fibrogen conduct sspecified promotional activities in the CKD-D market. **(2) China:** Both co-commercialize. Fibrogen is responsible for clinical trials, regulatory matters, manufacturing, and medical affairs. AstraZeneca is responsible for promotional activities and commercial distribution.
4/28/2006	Fibrogen Astellas	FG-2216 FG-4592 Other HIFα	All indications developed in US	EU CIS* Middle East South Africa	▪ **Upfront:** Fibrogen receives payments totaling $300M. ▪ **Equity:** Astellas makes an investment of $50M. ▪ **Milestones:** Fibrogen could receive total milestones of ≤$465M, of which ≤$130M is before filing and $335M is upon/after filing ▪ **Cost Sharing:** Astellas funds all specific development costs in EU and half of common costs in the EU and US. ▪ **Other:** Fibrogen has potential to receive >$2B if forecast for sales in Astellas' regions are achieved during the 10–15 years after 2010.
9/4/2004	Fibrogen Yamanouchi**	FG-2216 Other HIFα	Anemia	Japan	▪ Financial terms were not disclosed.

*CIS = Commonwealth of Independent States; **Astellas inherited agreement with Fibrogen following the merger of Yamanouchi and Fujisawa.

Sources: Astellas, AstraZeneca, Fibrogen, Credit Suisse research

Source: Astellas, AstraZeneca, Fibrogen, Credit Suisse research

Exhibit 34: **Appendix – FG-4592 – Study '017 PII Data in Stage 3/4 CKD-ND**

FG-4592 – Study '017 PII Data in Stage 3/4 CKD-ND

	Placebo	Cohort #1	Cohort #2	Cohort #3	Cohort #4
Dose	Placebo	0.7 mg/kg	1.0 mg/kg	1.5 mg/kg	2.0 mg/kg
Number of Patients	- - - - -	- - - - -	- - - - -	- - - - -	- - - - -
Max Hb Change by 6 Weeks (BIW)	+0.4 g/dL	+0.9 g/dL	+0.9 g/dL	+1.7 g/dL	+1.9 g/dL
Max Hb Change by 6 Weeks (TIW)	- - - - -	+1.1 g/dL	+1.0 g/dL	+2.0 g/dL	+2.2 g/dL
Response Rate*	8%	33%	60%	80%	100%
Safety/Tolerability	▪ Led to peak endogenous EPO levels of 1–2 orders of magnitude lower than reported values of ESAs ▪ Observed only 1 case of increased blood pressure at 0.7 mg/kg dose ▪ Did not observe any thrombosis, sustained liver enzyme abnormality, and drug-related SAEs				
Other	▪ Showed median time to Hb response of 22-43 days for BIW and 15-22 days for TIW in responders, generally faster than observed with ESAs ▪ Enrolled Stage 3/4 CKD-ND patients with Hb < 11.0 g/dL				

* Response Rate Definition: Increase Hb by >1 g/dL from baseline at any time from Week 3 to Week 6

Sources: BioMedTracker, Fibrogen, Credit Suisse research

Source: BioMedTracker, Fibrogen, Credit Suisse research

FG-4592 – Study '041 PIIb Data in Stage 3/4 CKD-ND

	Cohort A	Cohort B	Cohort C	Cohort D
Dose	60–140 mg; Start at weight-adjusted dose TIW with adjustment decisions made monthly	60–140 mg; Start at weight-adjusted dose TIW, followed by BIW	50 mg; Treat at fixed dose TIW	100 mg; Start at 100 mg for 4 weeks with adjustment decisions made ever 4 weeks
Number of Patients	24	24	23	24
Mean Hb Change at 4 Weeks	+1.6 g/dL	+1.1 g/dL	+0.6 g/dL	+1.5 g/dL
Mean Hb Change at 8 Weeks	+2.4 g/dL	+1.8 g/dL	+1.0 g/dL	+2.1 g/dL
Mean Hb Change at 16 Weeks	+2.3 g/dL	+2.3 g/dL	- - - - -	- - - - -
Response Rate	83% (16 Weeks)*	100% (16 Weeks)*	91% (24 Weeks)**	96% (24 Weeks)**
Safety/Tolerability	▪ Resulted in significant reduction in mean arterial pressure (–2.6 mmHg, p=0.03) from BL to EOT – Lowered systolic (–5.3 mmHg, p=0.03) and diastolic (–2.5 mmHg, p=<0.03) blood pressure from BL to EOT, followed by a rise in systolic blood pressure (+3.3 mmHg, p<0.04) in a patient subgroup treated with FG-4592 TIW without any changes in blood pressure medications ▪ Reduced mean total cholesterol during treatment, followed by a rebound after stopping treatment – Had similar drops in mean total cholesterol in patients on lipid-lowering agents (–16.5 mmHg) relative to patients not on lipid-lowering agents (–16.2 mmHg) – Led to reductions in LDL (18%, p<0.0001), VLDL (14%, p=0.014), triglycerides (13%, p=0.015), and HDL (8%, p=0.002) from BL to Week 9 – Lowered LDL by 7–33% in 4 patients with LDL above normal and already on statins – Raised mean HDL/LDL ratio from 0.56 to 0.67 at Week 9 (p=0.013) ▪ Reported lower hypertension incidences of 7% for FG-4592 (vs. historical 24–32% for Aranesp) ▪ Reduced platelet counts from baseline, maintaining within normal range (p<0.01)			
Other	▪ Success of treatment was not dependent on iron status at entry			

*Response Rate Definition: Increase Hb by at least 1 g/dL while maintaining Hb concentration at 11.0–13.0 g/dL at Week 16

**Response Rate Definition: Increase Hb by at least 1 g/dL while maintaining Hb concentration at 10.5–12.0 g/dL at Week 24

Sources: BioMedTracker, Fibrogen, Credit Suisse research

Source: BioMedTracker, Fibrogen, Credit Suisse research

FG-4592 – Study '040 PII Data in Stage 5 CKD-D

	Epoetin Alfa Arm (Subset)	FG-4592 Arm (Subset)	Epoetin Alfa Arm (All)	FG-4592 Arm (All)
Dosing	Standard TIW	FG-4592 TIW; Adjust doses every 4 weeks to maintain Hb levels at 11–13 g/dL	Standard TIW	FG-4592 TIW; Adjust doses every 4 weeks to maintain Hb levels at 11–13 g/dL
Iron Supplementation	None	None	None	None
Number of Patients	19	54	32	91
Treatment Duration	19 weeks	19 weeks	6–19 weeks	6–19 weeks
Mean Hb Change over Last 5 Treatment Weeks	–0.6 g/dL	–0.2 g/dL	- - - - -	- - - - -
Safety/Tolerability	▪ Observed that FG-4592 decreased total cholesterol at 6 weeks by 20%, whereas Epoetin Alfa increased total cholesterol at 6 weeks by 4.0% ▪ Made similar observations for total cholesterol change at 19 weeks			
Other	▪ Enrolled patients with Hb in ranges of 9.0–13.5 g/dL and 8.5–13.5 g/dL for "normoresponders" and "hyporesponders"			

Sources: BioMedTracker, Fibrogen, Credit Suisse research

Source: BioMedTracker, Fibrogen, Credit Suisse research

FG-4592 – Study '053 PII Data in Stage 5 CKD-D

	Cohort #1	Cohort #2	Cohort #3
Dose	FG-4592: Start dose tiered by weight, with dose adjustments allowed every 4 weeks	FG-4592: Start dose tiered by weight, with dose adjustments allowed every 4 weeks	FG-4592: Start dose tiered by weight, with dose adjustments allowed every 4 weeks
Iron Supplementation	None	Oral Iron	IV Iron
Number of Patients	12	12	12
Mean Hb Change at Week 8	2.1 g/dL	2.2 g/dL	2.3 g/dL
Mean Max Change in Hb	2.8 g/dL	3.3 g/dL	3.2 g/dL
Safety/Tolerability	▪ Observed no evidence of hepatotoxicity and/or drug-related SAEs		
Other	▪ Enrolled Stage 3/4 CKD-D patients with Hb < 10.0 g/dL		

Sources: BioMedTracker, Fibrogen, Credit Suisse research

Source: BioMedTracker, Fibrogen, Credit Suisse research

Exhibit 38: **Appendix – GSK-1278863 – PII Development Program**

GSK-1278863 – PII Development Program

Trial	Size (N)	Arms	Indication	Treatment Duration	Key Entry Criteria	Primary Endpoint(s)	Data Readout
Study '633 (Global)	176	▪ 4 mg QD GSK-'863* ▪ 6 mg QD GSK-'863* ▪ 8 mg QD GSK-'863* ▪ 10 mg QD GSK-'863* ▪ 12 mg QD GSK-'863* ▪ Placebo	Anemia in CKD-D	24 weeks	▪ Hb: 9.0–11.5 g/dL	▪ Change in Hb from baseline at 4 weeks	2015
Study '747 (Global)	228	1) GSK-'863 QD** 2) rEPO***	Anemia in Stage 3/4/5 CKD-ND	24 weeks	▪ Hb: 8.0–10.0 g/dL for rEPO naïve ▪ Hb: 9.0–10.5 g/dL for rEPO users	▪ Change in Hb from baseline at 24 weeks	2015
Study '837 (US)	20	1) 12 mg GSK-'863 QD*	Anemia in CKD-D (ESA-HR)	16 weeks	▪ Hb: 8.0–9.5 g/dL for 4–6K units/session ▪ Hb: 8.0–10.0 g/dL for >6K units/session	▪ Change in Hb from baseline at 16 weeks	2015
Study '099 (Japan)	95	▪ 4 mg GSK-'863 QD* ▪ 6 mg GSK-'863 QD* ▪ 8 mg GSK-'863 QD* ▪ 10 mg GSK-'863 QD* ▪ Placebo	Anemia in CKD-D	4 weeks	▪ Hb: 9.5–12.0 g/dL	▪ Change in Hb from baseline at 4 weeks	2014

*Dose may be adjusted after Week 4 based on Hb levels every 4 weeks

**Dose may be adjusted after Week 4 to achieve a Hb range of 9.0–10.5 g/dL

***rEPO will be administered as necessary to maintain Hb range of 9.0–10.5 g/dL

ESA-HR: ESA Hyporesponders

Sources: www.clinicaltrials.gov, GSK, Credit Suisse research

Source: www.clinicaltrials.gov, GSK, Credit Suisse research

BAY-85-3934 (Molidustat) – PII Development Program

Trial	Size (N)	Arms	Indication	Treatment Duration	Key Entry Criteria	Primary Endpoint(s)	Data Readout
DIALOGUE 1 (EU, A-P)	120	▪ 25 mg QD BAY'934 FD ▪ 50 mg QD BAY'934 FD ▪ 75 mg QD BAY'934 FD ▪ 25 mg BID BAY'934 FD ▪ 50 mg BID BAY'934 ▪ Placebo BID	Anemia in CKD-ND	16 weeks	▪ Hb: < 10.0 g/dL ▪ Weight: 45–125 kg	▪ Change in Hb from baseline to average during last 4 weeks of treatment period	2014/ 2015
DIALOGUE 2 (EU, A-P)	120	▪ 25 mg QD BAY'934 F+TD ▪ 50 mg QD BAY'934 F+TD ▪ 75 mg QD BAY'934 F+TD ▪ Aranesp	Anemia in CKD-ND	16 weeks	▪ Hb: 10.0–12.0 g/dL	▪ Change in Hb from baseline to average during last 4 weeks of treatment period	2014/ 2015
DIALOGUE 3 (EU, A-P)	240	▪ BAY'934 TD ▪ Aranesp	Anemia in CKD-ND	≤ 36 months	▪ Hb: 10.0–12.0 g/dL	▪ Change in Hb from baseline ▪ Safety	2017
DIALOGUE 4 (US, Japan)	148	▪ 25 mg QD BAY'934 F+TD ▪ 50 mg QD BAY'934 F+TD ▪ 75 mg QD BAY'934 F+TD ▪ Epoetin Alfa/Beta	Anemia in CKD-D	16 weeks	▪ Hb: 9.0–11.5 g/dL	▪ Change in Hb from baseline to average during last 4 weeks of treatment period	2014/ 2015
DIALOGUE 5 (US, Japan)	148	▪ BAY'934 CPD ▪ Epoetin Alfa/Beta	Anemia in CKD-D	≤ 36 months	▪ Hb: 9.5–11.5 g/dL	▪ Change in Hb from baseline ▪ Safety	2017

FD: Treat with fixed dose.

F+TD: Start at specific dose. Titrate every 4 weeks based on Hb response and tolerability of prior dose. Planned doses are: 15, 25, 50, 75, and 150 mg QD

TD: Titrate at scheduled dose control to maintain Hb range of 10.0–12.0 g/dL. Available doses are: 15, 25, 50, 75, 100, 150 mg/day QD

CPD: Continue dose used in DIALOGUE 4

Sources: www.clinicaltrials.gov, Bayer, Credit Suisse research

Source: www.clinicaltrials.gov, Bayer, Credit Suisse research

ACE-011 (Sotatercept) – PII Development Program

Trial	Size (N)	Arms	Indication	Treatment Duration	Key Entry Criteria	Primary Endpoint(s)	Data Readout
Study '011 (US)	43	▪ 0.3 mg/kg Q4W ACE-011* ▪ 0.5 mg/kg Q4W ACE-011* ▪ 0.7 mg/kg Q4W ACE-011* ▪ Placebo	Anemia in Stage 5 CKD-D	≤ 32 weeks	▪ Hb: 10.0–12.0 g/dL at screening as well as 8.0–10.0 g/dL at predialysis	▪ Pharmacokinetics	2015
Study '002 (EU)	60	▪ IV-DG 1/2/3 Q2W ACE-011 ▪ SQ-DG 1/2/3 Q2W ACE-011	Anemia in Stage 5 CKD-D	- - - - -	▪ Hb: 10.0–12.0 g/dL ▪ BMI: ≥ 18.5 kg/m^2	▪ Pharmacokinetics ▪ Safety	2015

*Patients will receive a single dose of 0.1 mg/kg ACE-011 before being randomized into 0.3, 0.5, or 0.7 mg/kg ACE-011 or placebo arms

IV-DG 1/2/3: Administer intravenously, starting at 0.1 mg/kg and escalating to 0.2 mg/kg and 0.3 mg/kg

SQ-DG 1/2/3: Administer subcutaneously, starting at 0.13 mg/kg and escalating to 0.26 mg/kg and 0.4 mg/kg

Sources: www.clinicaltrials.gov, Acceleron, Celgene, Credit Suisse research

Source: www.clinicaltrials.gov, Acceleron, Celgene, Credit Suisse research

Companies Mentioned *(Price as of 11-Apr-2014)*

Acceleron (XLRN.OQ, $36.54)
Akebia (AKBA.OQ, $16.86, OUTPERFORM[V], TP $25.0)
Amgen Inc. (AMGN.OQ, $111.94)
Astellas Pharma (4503.T, ¥1,092)
AstraZeneca (AZN.L, 3780.5p)
Bayer (BAYGn.DE, €92.81)
Celgene Corp. (CELG.OQ, $136.9)
Daiichi Sankyo (4568.T, ¥1,731)
Eli Lilly & Co. (LLY.N, $58.45)
GSK (GSK.N, $51.76)
Hanmi Pharm (128940.KS, W117,000)
Hospira Inc (HSP.N, $42.14)
Japan Tobacco (2914.T, ¥3,152)
Johnson & Johnson (JNJ.N, $96.87)
Novartis (NOVN.VX, SFr72.9)

Disclosure Appendix

Important Global Disclosures

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Restricted	2%	

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Price Target: (12 months) for Akebia (AKBA.OQ)

Method: Our DCF-derived TP of $25 is based on annual cash flows through 2027, a 10% discount rate, 50% probability of success, and no terminal value. The cash flows are based solely on revenues (direct sales in the US as well as royalties in the EU and Japan) form AKB-6548 as a treatment for anemia in chronic kidney disease on dialysis (CKD-D) and not on dialysis (CKD-ND) and add-back of all R&D expenses not associated with AKB-6548.

Risk: The risks to our TP of $25 are: (1) AKB-6548 is not approved or significantly delayed. (2) AKB-6548 does not demonstrate efficacy and/or safety expected from data on studies to date. (3) AKB-6548 could underperform our expectations for the product launch ramp and/or peak sales. (4) Anemia in CKD market may not become as large as expected.

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