EXHIBIT 47

CONFIDENTIAL – SUBJECT TO PROTECTIVE ORDER

UNITED STATES DISTRICT COURT

DISTRICT OF MASSACHUSETTS

AMGEN, INC., Plaintiff, vs. F. HOFFMANN-LA ROCHE, LTD., a Swiss Company, ROCHE DIAGNOSTICS GmbH, a German Company, and HOFFMANN-LA ROCHE, INC., a New Jersey Corporation, Defendants	)	Civil Action No : 05-12237 WGY **EXPERT REPORT OF PROFESSOR EINER ELHAUGE**

April 6, 2007

(3) ignores pricing responses by the defendant that would make it impossible for rivals to win sales against bundled pricing by just lowering their prices to cost;
(4) ignores the fact that foreclosing less efficient rivals can also have an anticompetitive harm;
(5) ignores the concern that foreclosure impairs rival expandability or aids in oligopolistic coordination;
(6) ignores the concern that intermediate buyers might collude with sellers to create foreclosure that can exploit downstream buyers and split supracompetitive profits;
(7) is difficult to administer because reliable cost data is hard to assess and obtain; and
(8) ignores the fact that what requires justification is not the pricing, but rather the exclusionary conditions attached to the pricing.[260]

Thus, the attribution test is the wrong economic test to determine whether anticompetitive foreclosure has occurred because it is biased against finding foreclosure.

129. In any event, even if one applied an attribution test, it would be met here. We can perform such an attribution test using aggregate data on the total purchases, discounts, and rebates on Aranesp, Neulasta, and Neupogen made by AAA hospitals. Because I lack cost data, I must perform an extraordinarily conservative version of the attribution test that ignores the costs of making and selling ESAs.[261] Applying this attribution test shows that, like the Fresenius contract, the AAA contract prevents rivals from switching even a percentage of their sales to Mircera, because doing so would require Roche to pay hospitals to offset the lost discounts and rebates. Likewise, it shows that even if the AAA hospitals were willing to switch 100% of their Aranesp purchases to Mircera at once, that Roche could only induce hospitals to do this by offering a price that is significantly lower than the price Amgen charged for the same ESAs, thus depriving Roche of the ability to compete on an equal footing for buyers.

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[260] *See* ELHAUGE & GERADIN, GLOBAL ANTITRUST LAW AND ECONOMICS 628-31 (Foundation Press 2007); *see also id.* at 544-51 (discussing four types of anticompetitive effects from bundling).

[261] A standard attribution test asks whether an equally efficient rival could offset the bundled discounts by pricing its product at the dominant firm's cost of making that product. I instead ask whether a rival could offset the bundled discounts by giving away its product, a much more conservative test that ignores the need to recover costs.

130. I start by calculating the aggregate rebates and discounts received on Aranesp, Neulasta, and Neupogen by all AAA hospitals from April 2006 onward.[262] I find that in total, AAA hospitals received $176.7 million in discounts on Aranesp, $103.9 million in rebates on Aranesp, $57.2 million in rebates on Neulasta, and $13.9 million rebates on Neupogen. Because the DDD data show that hospitals divide their non-ESRD ESA purchases almost exactly in half between Aranesp and Procrit, I assume that once Mircera enters hospitals would (absent the exclusionary contracts) divide their non-ESRD ESA purchases evenly between Aranesp, Procrit, and Mircera.[263] This would require hospitals to switch 33% of their current non-ESRD ESA purchases to Mircera. I assume that this 33% will come in proportionate shares from Aranesp and Procrit, meaning that the average hospital would shift 33% of their Aranesp to Mircera.

131. However, Amgen's AAA contract precludes hospitals from making this shift to Mircera. The reason is that this shift would cause the AAA hospitals to fall below the 40% Aranesp compliance requirement, which would reduce their discounts on Aranesp from 25% to 5% and would preclude them from receiving any rebates on Aranesp, Neulasta, or Neupogen.[264] The result is that switching 33% of their Aranesp purchases to Mircera would cause the AAA hospitals to lose $328.81 million in discounts and rebates.[265] But this means that the hospitals would never switch to Mricera because only $135.4 million in sales in total will be shifted to Mircera from Aranesp.[266] Thus, Roche not only would have to give away its Mircera but pay AAA hospitals $193.41 million to induce them to make this switch. And this calculation ignores all of Roche's costs of supplying Mircera. The exclusionary contract thus prevents hospitals from splitting their purchases between three different ESAs, as they may wish to do once Mircera launches. It also prevents hospitals from switching only a portion of their ESA purchases to Mircera in a way that would allow them to step-up

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[262] I calculate these numbers using the figures in Amgen's ASP model. *See* "ASP Model_v133.xls", AraLEDR, E96-G102; NPLEDR, E94-G100; NLLEDR, E94-G100.

[263] *See infra* Tables 7-8.

[264] It drops AAA hospitals below the 40% compliance level because shifting 33% of Amgen's current 51.1% share to Mircera reduces the overall share of non-ESRD ESA purchases made from Amgen by 17.1% to 34.1%.

[265] This figure breaks down as follows: (1) $153.81 million in lost discounts on the remaining purchases of Aranesp from switching from a 25% discount to a 5% discount; and (2) $175 million in lost rebates, $103.9 million on Aranesp, $57.2 million on Neulasta, and $13.9 million on Neupogen.

[266] This figure is calculated as the total Aranesp sales minus all discounts and rebates offered on Aranesp multiplied by the 33%, which is the share of Aranesp sales that would be shifted to Mircera.

their usage of Mircera over time, as one might expect would be a rational approach for a hospital with multiple physicians to take when adopting a new drug.

132. Even if the AAA hospitals were able to persuade all their physicians to simultaneously and abruptly switch all of their Aranesp purchases to Mircera, the foreclosing effect from these contracts is still obvious because this would result in AAA hospitals losing $71.1 million in rebates on the Neupogen and Neulasta that they continue to purchase from Amgen.[267] This means that Roche would have to offer a much lower price for its ESAs than Amgen charged to induce buyers to switch to its product. Specifically, Roche would only be able to price at 84.7% of Aranesp's price because otherwise it would not be able to offset the lost discounts on Amgen's bundled WBC stimulators.[268] Although this would not fail the attribution test, as I have described (1) I am applying an extraordinarily conservative version of the attribution test that ignores the costs of manufacturing ESAs; and (2) even when cost data is available, the attribution test itself is an unduly conservative test for whether foreclosure has occurred. Thus, this demonstration that the AAA contract would impede Roche's ability to compete for AAA hospitals by forcing Roche to offer a significantly lower price than Amgen to compete for the same buyers is more than sufficient to demonstrate that Amgen's contracts have an exclusionary effect on Amgen's rivals that also harms competition and consumers.[269]

133. *c. Further Evidence of the Contracts' Exclusionary Effects.* Several Amgen documents confirm that Amgen's strategy was to threaten buyers with pricing penalties if they did not agree to Amgen's exclusionary offers. One document states that a contracting strategy of Amgen was to approach LDOs and SDOs with the opportunity to get more attractive terms and rebates in exchange for exclusivity prior

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[267] These rebates are the total amount of rebates paid on Neupogen and Neulasta, all of which would be lost.

[268] This figure is calculated as follows. AAA hospitals spent in total $686.7 million on Aranesp in the last three quarters of 2006 under consideration here. This price was reduced by $171.68 million in off-invoice discounts (at the 25% level) and $51.5 million in rebates (at the 10% level after subtracting off the discounts). In total, then, AAA hospitals spent $463.52 million to acquire Aranesp in the relevant period. Roche, however, must offer the same amount of ESA at $71.1 million less than Amgen charged to offset the pricing penalties on Neupogen and Neulasta that Amgen would impose if the AAA hospitals switched their purchases to Amgen. Thus, Roche can only charge $392.42 million for the same amount of ESA that Amgen charged $463.52 million. $407.35 million is 84.7% of $463.52 million, meaning that Roche must charge an 84.7% lower final price than Amgen did to overcome the exclusionary bundle.

[269] This lower cost might also make the sales unprofitable to Roche and thus impossible for Roche to do, but I have not been able to find reliable cost data to assess this.

anticompetitive effect. Even this figure is a conservative estimate because other customers likely were foreclosed by the threats as well, but I currently lack the data to identify those customers and their foreclosed purchases. The above thus represents the foreclosure caused by only a subset of Amgen's anticompetitive conduct.

B. The Share Foreclosed of the Non-ESRD ESA Market

157. To calculate the share foreclosed of the non-ESRD ESA market, I again use the 2006 DDD data.[330] For the reasons noted above, I assume that all public health services hospitals are under the DSh contract, and all other hospitals are under the AAA contract. I treat a hospital as foreclosed if it would be penalized with higher prices or lower rebates if a reduction in Aranesp purchases would cause it to fall below its current tier. I treat as foreclosed only the share of their non-ESRD ESA purchases each hospital needs to maintain to avoid such price penalties. For example, if a hospital would lose discounts or rebates on WBC stimulators if it fell below a 40% Aranesp share of non-ESRD ESA purchases, I treat that hospital's non-ESRD ESA purchases as only 40% foreclosed.

158. The resulting calculation shows that Amgen's bundled hospital contracts alone foreclosed at least 22.75% of the non-ESRD ESA market. This alone exceeds the 20% level that standard antitrust economics finds should be deemed presumptively unreasonable.[331]

159. Further, this 22.75% figure likely understates the total true foreclosure share from bundled contracts because my calculations excluded all sales made to oncology clinics, even though the evidence indicates that Amgen's oncology clinic

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[330] I here assume that non-ESRD sales are equal to the total sales of Aranesp and Procrit not made to dialysis centers (which I treat as being exclusively for ESRD), because of the evidence that Amgen sells Epogen to ESRD buyers alone and that J&J is precluded by its licensing agreement from selling Procrit in the ESRD ESA market. Although this method might miss some small amounts of sales of Aranesp or Procrit in ESRD or Epogen in non-ESRD, the data available unfortunately does not provide another method of determining which sales occur in which market. The DDD data also provides only a total figure for WBC stimulator purchases and does not distinguish between Neulasta and Neupogen purchases and Leukine purchases. I thus assume that all WBC stimulator purchases are made from Amgen. This assumption likely boosts the Amgen market shares of some hospitals above what they actually are.

[331] *See* IX AREEDA, ANTITRUST LAW 377, 387-91 (1991) (concluding that "foreclosure [should] be presumed unreasonable when it reaches 20 percent for an individual seller.")