Deal Terms in Alzheimer's Disease 2000-2014

Avance, Basel GmbH

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Analysts

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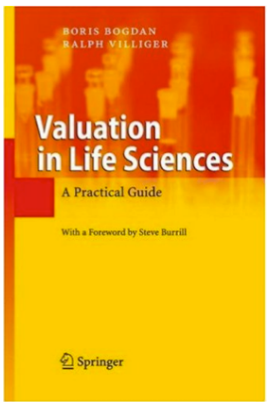

Avance has been founded in 2004 and has become a globally renowned expert in valuation in the life science industry since then. Avance offers financial advisory services and software solutions to the life science industry. Clients include large pharmaceutical companies, biotech companies, investors, and research institutions. Avance has taught over 500 life science professionals in valuation and negotiation and has become the number one reference in valuation with its book "Valuation in Life Sciences. A Practical Guide".

1 Introduction

License contracts have become an important business model in the pharmaceutical industry. It provides R&D companies an earlier access to revenues through upfront and milestone payments, which is even more important in times when raising capital becomes an ever more difficult challenge. For the pharmaceutical companies the licensing model enables them to tap the wealth of innovative projects that do not come out of their own laboratories, without having to acquire the whole company the project of interest is embedded in. Since license contracts represent a more and more accepted exit for biotech companies out of the cash burning investment period to profitability, the financial terms are in the focus. The license deal is *the* moment, when the market – in this case the pharmaceutical companies – put a value to a project. For the licensors it is therefore of utmost importance to achieve the best possible deal terms, as these define the value of the project. But the business developers are faced with the problem of a very opaque market. Typically, a business developer wants to crosscheck his own assumptions and perceptions of what the project is worth and what he can ask for or should pay. In a universe where expenses are relatively certain and revenues highly uncertain, i.e. with a considerable operational leverage, one is grateful to have some orientation and some confirmation whether their own view is realistic and gets supported by peers. This is typically done with a comparative analysis.

Unfortunately, the financial terms of most license contracts remain confidential. In the press releases only few numbers are revealed. Usually, the upfront payment, the total sum of milestones, and perhaps the number of digits of the royalty rate are revealed. Very confusingly, the sum of milestones is often labeled as "deal value". For negotiations this is of little use. One wants to know what upfront, milestones and royalties are possible, what sales assumptions can be defended, and what are the criteria for a fair deal.

This report provides this information. By valuing several scenarios of the same deal by changing the deal structure and the sales assumptions we can determine which scenario looks the most realistic and whether the closed deal is more favorable to the licensor or the licensee.

4 How to read this report

4.1 First Page

Each deal is presented in two pages. The first page is purely documentary. It contains typically all the non-confidential data that is available:

- General (partners, stage, date),
- Scientific details (type of molecule, mechanism of action, indication),
- Deal type (straight license, profit share, co-development or co-commercialisation, geographic separation),
- Reported deal terms,
- Deal summary (press release),
- Sources.

Common industry reports present this information. We, however, add some insight to this, which you can only get with valuation. This is then presented on the second page.

4.2 Second Page

Based on the disclosed information we assume hypothetical deal terms. The milestones typically increase the closer they are to approval. Sometimes milestones can be spread over various indications. All together they must sum up to the often-reported sun of all milestones. We also pick a royalty rate and assume some peak sales. We run different peak sales assumptions and modify the hypothetical financial terms in such a way that the deal look most realistic in terms of value share, IRR to the licensee, and royalty/deal value ratio. Of course, an infinity of scenarios are possible. But the main goal is to show what terms are most realistic and we present a representative sample of scenarios. Interestingly in most cases one scenario looks more probable than others. We also add an explanation why we perceive some scenarios as more likely than others.

Table 4: Example scenarios of one deal analysis

Peak Sales	Upfront	Lead candidate	Preclinical	Phase 1	Phase 2	Phase 3	Filing	Approval	Sales Milestones	Total Milestones	Royalties	Total Value (at 12%)	Value Share Licensor	IRR Licensee	Royalties/Deal Value
4,000	**0**	**2.5**	**6.5**	**1.3**	12.7	25	37	75	105	**265**	5%	81	24%	19.1%	40%
5,000	**0**	**2.5**	**6.5**	**1.3**	16	34	51	108.7	45	**265**	5.5%	108	23%	20.3%	45%
6,000	**0**	**2.5**	**6.5**	**1.3**	16	34	51	108.7	45	**265**	6%	129	22%	20.9%	48%
8,000	**0**	**2.5**	**6.5**	**1.3**	20	48	53	118	30	**265**	7%	261	17%	26.6%	68%

In bold we indicate the known deal terms. We make assumptions for the remaining deal terms and indicate the quality of the deal with several metrics:

- Total value (Licensor + Licensee, calculated at 12% discount rate),
- Value share for licensor,
- IRR for licensee,
- Royalties/deal value ratio.

With this analysis one disposes now of cash flows projections instead of only vague numbers describing a deal such as overall sum of milestones. This allows valuing companies, assessing possible license terms, or comparing the own contract with peers.

The analysis has, of course, too many degrees of freedom. On the one hand we can modify the deal terms to a large degree, e.g., back-loaded vs. front-loaded deal terms, low vs. high royalty rates, and so on. On the other hand we can modify the sales assumptions. However, the freedom in choosing the deal terms is quite limited due to some constraints:

- Upfront is often known.
- Often the total sum of milestones is reported.
- Milestones usually increase towards approval.
- If it is reported that there are also sales milestones, these are also included in the sum, except specially mentioned.
- If several indications are mentioned the milestones are spread over these indications, but there is quite some room for interpretation as to how they are spread.
- Royalties are sometimes said to be one or two digits, or high single digit, etc.

Even though still a myriad of license terms seem possible, the changes have to be quite drastic to make a real difference in the valuation. Most often it is more important to select the right number of indications that are going to be developed (i.e. that were meant to be developed in the valuation model of the license partners at negotiation). Therefore the analysis enlightens to an astonishing degree what sales assumptions the companies have used, provided they have calculated with similar success rates and timelines.

All deals are displayed in USD.

5 Deals

Table 5: License deals in Alzheimer's disease therapeutics (2000 – 2013)

Deal	Candidate	Class	Type	MoA	Year	Phase
Ablynx / Böhringer Ingelheim	Nanobodies	Biological	mAb	-	2007	Discovery
Neurimmune / Biogen		Biological	mAb	Anti-Aβ	2007	Discovery
Alectos / Merck		Chemical	Small molecule	O-linked N-acetylglucosaminidase (O-GlcNAcase)	2010	Discovery
AC Immune / Genentech	Anti-Tau antibodies	Biological	mAb	Anti-Tau	2012	Discovery
AC Immune / Genentech	Crenezumab (MABT5102A)	Biological	mAb	Anti-Aβ	2006	Preclinical
reMYND_Roche		Chemical	Small molecule	Tau	2010	Preclinical
Cytos / Novartis	CAD106	Chemical	Vaccine	Anti-Aβ	2001	Phase 1
Targacept / AstraZeneca	TC1734 (AZD3480)	Chemical	Small molecule	α4ß2 nicotinic (nAChR) receptor activator	2005	Phase 1
Transition /Elan	AZD-103/ELND005	Biological	mAb	Blocks accumulation & aggregation of Aβ-oligomers	2006	Phase 1
Affiris / GSK	AD01/AD02/AD03	Chemical	Vaccine	Anti-Aβ	2008	Phase 1
Bionomics/Merck	BNC375	Chemical	Small molecule	α7 nicotinic acetylcholine receptor (nAChR) modulator	2014	Phase 1
EPIX / GSK	PRX-03140	Chemical	Small molecule	GPCR (5HT4) agonist	2006	Phase 2a
Trans Tech Pharma / Pfizer	TTP488	Chemical	Small molecule	RAGE agonists	2006	Phase 2b
Neurosearch / Böhringer Ingelheim	NS2330	Chemical	Small molecule	Monoamine inhibitor	2002	Phase 2a
Evotec / Roche	EVT 302	Chemical	Small molecule	Monoamine Oxidase-B (MOA-B) inhibitor	2011	Phase 2b
Adamas / Forest	Arimenda	Chemical	Small molecule	AchE Inhibitor & NMDA antagonist	2012	Phase 2
Lundbeck / Otsuka	Lu AE58054	Chemical	Small molecule	5-HT6-receptor antagonist	2013	Phase 2
Newron / Merck Serono	Safinamide	Chemical	Small molecule	Monoamine oxidase-B & Dopamine inhibitor	2006	Phase 3
Myriad / Lundbeck	Furizan	Chemical	Small molecule	γ-secretase inhibitor	2008	Phase 3
Medivation / Pfizer	Dimebon	Chemical	Small molecule	AchE & NMDA inhibitor	2008	Phase 3
Elan / JnJ	Bapineuzumab	Biological	mAb	Anti-Aβ	2009	Phase 3

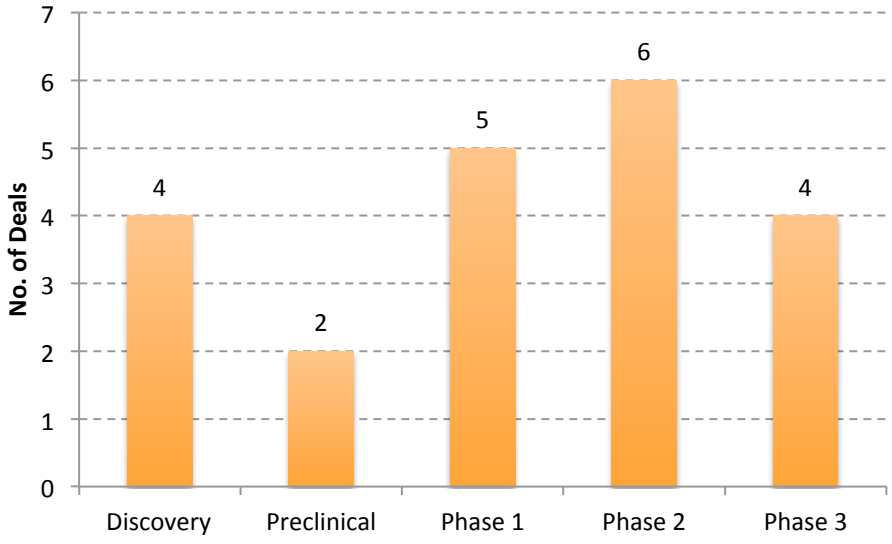

Figure 4: Number of license deals by stage.

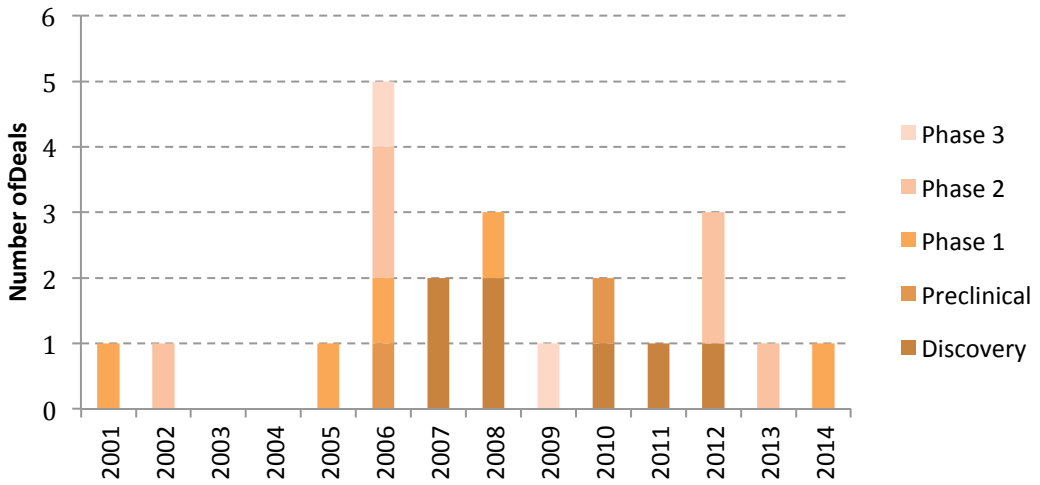

Figure 5: Number of license deals by time and stage.

In total we present the analysis of 20 deals. They are spread over the whole period and no clear trend shows.

On the other hand, the Anti-Aβ pathway was the one with most deal activity. However, recent set-backs of Anti-Aβ projects make alterantive mechanisms of action more attractive.

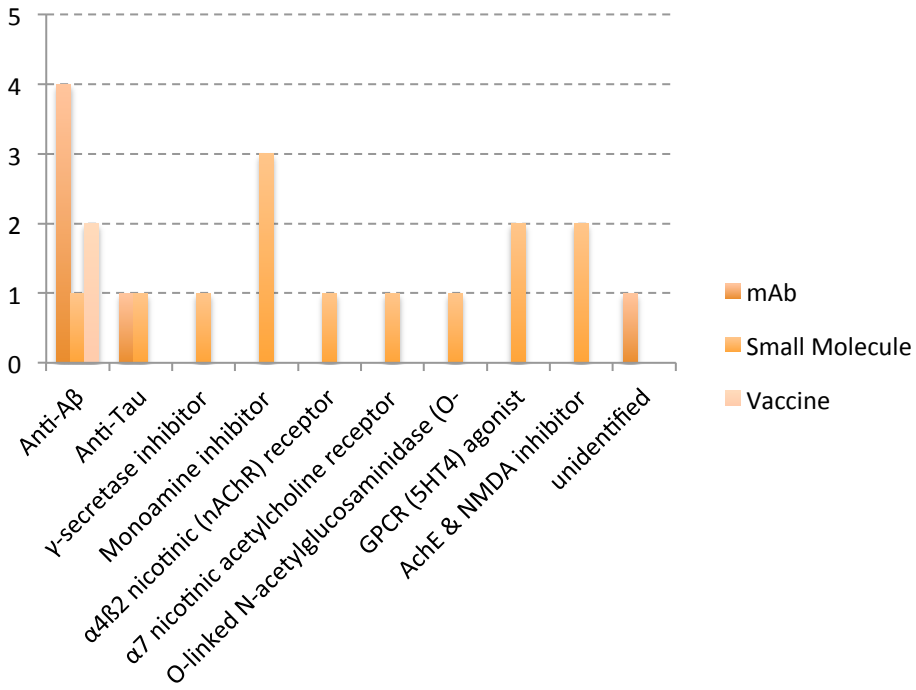

Figure 6: Deals by disease pathway.