Analyst Report
Coverage initiated on June 24th, 2015
Aurgalys is contracted by OSE Immunotherapeutics to provide equity research

Aurgalys

Jamila El Bougrini, PhD
Mickael Dubourd, PhD, SFAF
Paris & Evry, France

OSE Immunotherapeutics

Euronext Paris: OSE [FR0012127173]

November 22th, 2016

Estimated price:	€18.08
Share price (€) (as of November 22th, 2016)	6.02
High/Low (€) (since Jan. 1st, 2016)	8.59/5.30
Market Cap. (€M) (as of Nov 22th, 2016)*	85.79
Estimated Net Cash (€M)	15.0
Estimated Market Cap. (€M)	255.9
Number of shares (M)	14.2
Estimated price (€)	18.08
3-month average daily volume	6,690
Free Float	48.0%

Euronext since Jan. 1st, 2016	
OSE Immuno.	*-26.3%*
*Alys France**	*-21.9%*
Next Biotech	*-21.7%*
CAC Healthcare.	*-5.7%*
CAC 40	*-1.91%*
CAC Small	*+0.61%*

** Index of French smallcaps (less than €1B market capitalization at time of inclusion) in the healthcare and life sciences sector, listed on Euronext Paris.*
See http://www.aurgalys.com/aurgalys-indices

OSE Immunotherapeutics

OSE Immunotherapeutics, different strategies to improve the fight against cancer

OSE Immunotherapeutics is specializing in immunotherapy: immunoactivation to fight cancer and immunomodulation to treat several auto-immunity diseases and GvHD (Graft versus Host Disease). Immunotherapy is a huge field consisting of several therapy strategies that all use the immune system to treat diseases. Oncology has been a hot topic in recent years thanks to the successful approval of immunotherapy drugs targeting cancer. Recently, Tecentriq, Genentech's immune checkpoint inhibitor (ICI), has been approved by the FDA to treat bladder cancer and for the treatment of people with metastatic NSCLC. Thus, Tecentriq appears to close the gap in the market-share race, despite its late entry. With the 3rd ICI approved to treat NSCLC, OSE's strategy to evaluate Tedopi in combination with an ICI in NSCLC, appears more and more to have a strong rational.

Lung cancer, a first indication for OSE Immunotherapeutics

OSE Immunotherapeutics' lead program, Tedopi, is a cancer vaccine composed of 10 epitopes corresponding to the five most common cancer antigens. The therapeutic strategy consists to specifically activate the immune system against these antigens only present on cancer cells surface. This program has already demonstrated positive effects in NSCLC, and Tedopi is currently evaluated in an international Phase III trial, Atalante 1, conducted in Europe and the United-States. Results are expected by the end of 2018 and should offer promising perspectives for patients suffering from NSCLC. But one of the main company strengths is the universal potential of Tedopi, meaning that the vaccine could be effective in any cancer, should cancer cells express at least one of the 5 antigens. Thereby, Tedopi can be given to other cancers, in patients expressing the HLA-A2 receptor. OSE Immunotherapeutics is already considering launching Phase II studies in various cancer types, such as ovarian, breast, colon cancer, or mesothelioma, in patients HLA-A2 carriers. But the prior strategy considered by the company, is to explore Tedopi's potential in combination with an approved cancer drugs, especially an ICI, to offer a strong solution for NSCLC.

Combination therapy at the heart of OSE's strategy…

The current emerging onco-strategy is to give drug combination with the aim to boost and improve the therapeutic response. To reach the most efficient result, different drugs should act on different pathways or use different approaches with a unique goal: targeting cancer cells specifically for their neutralization, destruction, or starvation. Then, the cumulative effects of the different drugs should lead to a higher therapeutic response, and a better neutralization of cancer. The combination strategy gives different advantages in comparison with monotherapies:

↗	↘
synergy of the two (or more) treatments: complementary effects	decrease in dosage: lower doses needed to reach the therapeutic threshold
increase of therapeutic effects: improvement thanks to the different pathways targeted	decrease in side effects: lower doses lead to lower side effects

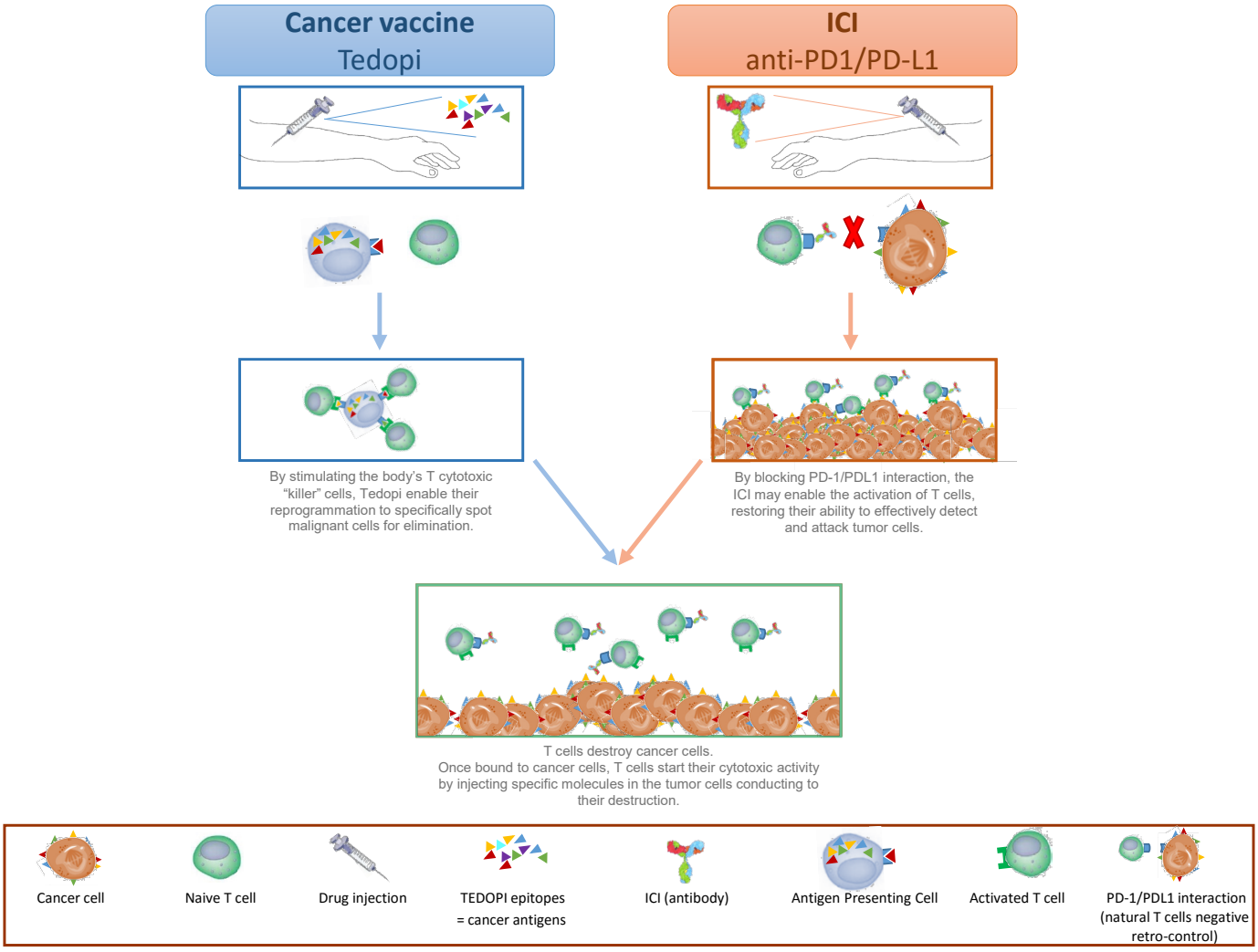
Tedopi's mechanism of action makes it a good candidate for combination therapy in NSCLC. Indeed, its combination with other immunotherapies could show synergistic effects in NSCLC treatment, especially in combination with an ICI. Several studies have been launched to evaluate the efficacy of these ICI treatments in combination with other drug-candidates. This suggests the possibility of synergies between Tedopi and an ICI thanks to the complementary approach and the action through two distinct pathways: the specific activation of the immune system with Tedopi, and a global boost of the immune system with an ICI.

The purpose of the combination is to activate a cluster of specific cells armed to recognize and destroy cancer cells (Tedopi's action), and to maintain this activation through the inhibition of the natural negative retro-control of the immune system (ICI's action). Therefore, the combination of Tedopi that specifically activates the immune system, with an ICI that modulates the immune system, could give promising results in light of recent studies using ICI in monotherapy or in combination.

OSE Immunotherapeutics clearly announced its project to evaluate Tedopi in a combination therapy with an ICI targeting PD-1 or its ligand, PD-L1. Although anti-CTLA-4 drug is one of the first ICI to be approved, and with proven efficacy against cancer, it also causes severe side effects compared to PD-1 and PD-L1, and a lower efficacy profile. Thus, OSE is to choose between the three PD-1/PD-L1 ICIs currently approved in NSCLC: Nivolumab (Opdivo, Bristol-Myers Squibb), Pembrolizumab (Keytruda, Merck), and Atezolizumab (Tecentriq, Roche). With regard to the latest studies, it seems that Keytruda and Tecentriq should be better options than Opdivo. Indeed, in one of these studies, Keytruda was tested as a 1st line standalone treatment, rather than as part of a combination of drugs. Patients in the trial had advanced NSCLC, and their tumors tested

positive for PD-L1 levels of 50% or more. The trial met both the primary endpoint of progression-free survival and secondary endpoint of overall survival. On the other hand, in August, Bristol-Myers Squibb saw its share price drop after the company indicated its cancer drug Opdivo failed to demonstrate efficacy in first-line treatment for lung cancer. Opdivo and Keytruda have been battling to get strong market share in a variety of cancers. Approval for first-line treatment in lung cancer, one of the most morbid and lethal cancers, is a decisive step for immuno-oncology drugs, as it will lead to significant increase in revenues. Moreover, German Merck and Pfizer's collaboration to bring a fourth PD-1/PD-L1 inhibitor to the market is now underway. Avelumab is currently in Phase III in both 1st line, and 2nd line NSCLC.

However, despite significant progress made with PD-1/PD-L1 inhibitors, the majority of patients do not respond to these drugs when given alone, so combination use with other drugs is a key strategy for all developers. Taking together, these elements strengthen OSE Immunotherapeutics' strategy to select the ICI that will demonstrate the best efficacy in treating NSCLC and that has the best profile for a combined use.



… Effi-DEM, new perspectives for combination therapy

The company is currently developing Effi-DEM, a new generation ICI for cancer treatment. This specific program is completely in line with OSE Immunotherapeutics' strategy to evaluate Tedopi in combination therapy. This indicates that the company currently owns two complementary drug candidates which could show high synergy to treat cancers with unmet medical need, if used together or in combination with other approved therapies. Effi-DEM is a second generation checkpoint inhibitor that blocks the SIRPalpha (Signal Regulatory Protein Alpha) receptor and transforms Myeloid Derived Suppressor Cells (MDSC) and Tumor-Associated Macrophages (TAM) into non suppressor cells. Through its action, the immune system is thus reactivated and tumor growth is blocked.

Taken together, these elements highlight the potential of OSE Immunotherapeutics' products to treat cancer. It already comforts the company's position in the immuno-oncology race, and the rational of its upcoming program to evaluate Tedopi in a combination study with one of the 3 lead ICI.

Valuation and Stock Performance of OSE Immunotherapeutics

At this stage, we maintain our valuation of OSE Immunotherapeutics to €18.08 per share. This target price includes the value associated with the Tedopi and FR104 drug candidates, in NSCLC treatment and Rheumatoid Arthritis, respectively. In our model, we included the licensing deal with Janssen Biotech with the financial terms provided by the company: a €155M deal, including an upfront payment of €10M, a 10% royalty rate on sales.

Unfortunately, OSE Immunotherapeutics didn't benefit from the last macroeconomic events, and more specifically, the US elections that led to a Biotech market increase. This could be partly explained by low volumes. The YTD performance of OSE Immunotherapeutics is -26.32% closing at €6.02 per share on November 22th, 2016.

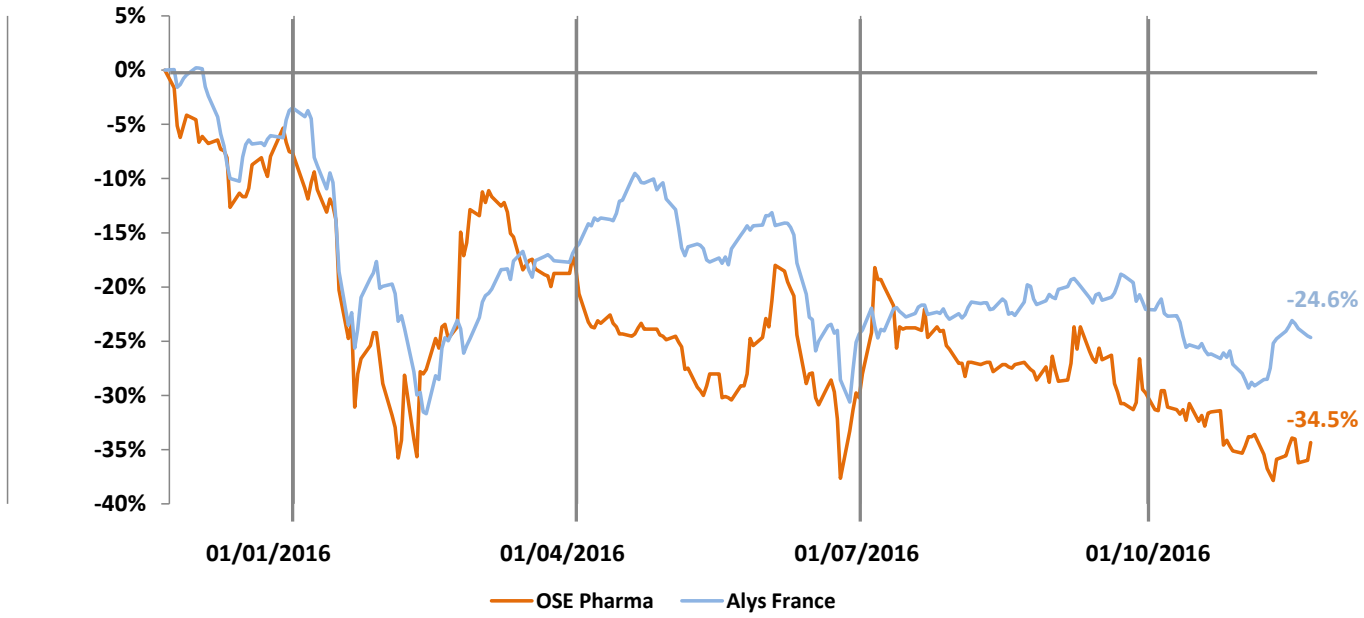


Figure 1. One-year chart dated November 22th, 2016, comparing the performance of OSE Immunotherapeutics's stock with French smallcaps of the life sciences and healthcare sector (Alys France index).

Financial Data

Statements for the years 2013, 2014, and 2015 are OSE Pharma's financial statements. Estimated figures are for OSE Immunotherapeutics.

Earnings Per Shares (€)	**2013**	**2014**	**2015**	**2016e**	**2017e**	**2018e**
EPS	-0.03	-0.36	-0.59	-0.42	-0.39	-0.26

Income Statement (€M)	**2013**	**2014**	**2015**	**2016e**	**2017e**	**2018e**
Revenues	0.0	0.0	0.0	3.3	3.3	3.3
EBIT	-0.3	-2.8	-5.6	-6.5	-6.0	-4.2
Net Income	**-0.3**	**-2.8**	**-5.6**	**-6.0**	**-5.5**	**-3.7**

Balance Sheet (€M)	**2013**	**2014**	**2015**	**2016e**	**2017e**	**2018e**
Non-Current Assets	0.0	0.1	0.1	59.8	58.3	56.8
Current Assets	0.3	1.9	16.9	22.6	14.2	8.1
Including Cash and Cash equivalents	*0.3*	*1.1*	*9.3*	*15.1*	*6.8*	*4.4*
Total Assets	**0.3**	**2.0**	**17.0**	**82.4**	**72.5**	**65.0**
Total Equity	**-0.9**	**-0.8**	**14.5**	**57.4**	**51.9**	**48.2**
Non-Current Liabilities	1.1	0.9	0.2	16.0	15.1	14.1
Current Liabilities	0.1	1.9	2.3	8.9	5.5	2.6
Total Equity and Liabilities	**0.3**	**2.0**	**17.0**	**82.4**	**72.5**	**65.0**

Cash Flow Statement (€M)	**2013**	**2014**	**2015**	**2016e**	**2017e**	**2018e**
Cash from operating activities	-0.2	-1.9	-4.6	1.8	-7.8	-5.2
Cash from investing activities	0.0	0.0	-6.2	-0.1	-0.1	-0.1
Cash from financing activities	0.3	2.8	19.1	-1.0	-0.5	2.8
Change in Cash	**0.1**	**0.8**	**8.2**	**0.8**	**-8.3**	**-2.4**

Notes

Disclaimer

This study has been prepared based on general and public information assumed to be complete, exact and pertinent. Although all necessary precautions have been taken to assure that the information used originates from reliable sources, Aurgalys does not guarantee the accuracy or completeness of this report.

Neither Aurgalys nor any of its associates may be held liable in any manner whatsoever in the event that any of the documents and other information on which the study has been based proves to be inaccurate and in any way resulting in the possible misrepresentation of the economic and financial position of the Company or any other relevant information.

The valuation contained herein has been prepared in accordance with the best assessment of Aurgalys as at the date of preparation of this study and has been based on the information as described above. Neither Aurgalys nor its associates guarantee that the value so obtained will correspond or coincide with the price that could effectively be paid in a transaction or established in a negotiation or any transaction or calculation involving the Company.

This document does not constitute an offer or an invitation to buy or subscribe to negotiable or other securities. It may not be used in any manner in support of or in connection with any contract or commitment. This document is being supplied for information purposes only and may not be reproduced or passed on to any third party without the written authorization of Aurgalys. This document has been provided to the Company prior to its distribution.

Aurgalys does and seeks to do business with companies covered in its research reports. As a result, investors should be aware that the firm may have a conflict of interest that could affect the objectivity of this report. Investors should consider this report as only a single factor in making their investment decision.

You may call +33(0)1 75 66 20 52 or write to m.dubourd@aurgalys.com to request a copy of this independent research

Aurgalys
1, rue Pierre Fontaine
91058 Evry Cedex
France
www.aurgalys.com

Join our group on Linkedin
Follow us on Twitter @ aurgalys

Acknowledgements

Special thanks to Chris Wilkinson (B.Sc. Pharmacy, US trader) for her detailed and constructive comments

About Aurgalys indices

Aurgalys launched on October 2013, the Alys France index measuring the performance of the 40 French smallcap companies (less than €1B of market capitalization) listed on Euronext/ Alternext Paris. Three other indices also measure the performance of companies dedicated to the development of therapeutic molecules (Alys Therapeutics), diagnostic tests (Alys Diagnostics), medical devices (Alys Medtech) and Greentech (Alys Greentech). You can find our reports on our website at http://www.aurgalys.com/aurgalys-indices

About Aurgalys

First company dedicated to life sciences and healthcare company financing, Aurgalys assists private or listed companies during capital increase, provides equity research or valuation services, takes care of investor relations and assists the management for their strategy and business development. Listing Sponsor Alternext (NYSE Euronext). Conseil en Investissement Financier ORIAS n°730782 ACIFTE.