EDISON

# Oncology Venture

Clinical update

## PARP inhibitor Phase II study initiates

Pharma & biotech

**Oncology Venture (OV) recently announced the initiation of its open-label Phase II study of 2X-121, a dual PARP-1/2 and TNKS-1/2 inhibitor, as a single agent in patients with metastatic breast cancer (mBC). The first patient, selected by OV's 2X-121 drug response predictor (DRP) mRNA biomarker, was dosed in late June 2018. Also, OV announced that its impending merger with the Medical Prognosis Institute (MPI) will happen in September 2018. OV shareholders will own 51% of the new company.**

| Year end | Revenue (SEKm) | PBT* (SEKm) | EPS* (SEK) | DPS (SEK) | P/E (x) | Yield (%) |
|---|---|---|---|---|---|---|
| 12/16 | 1.3 | (40.5) | (3.33) | 0.0 | N/A | N/A |
| 12/17 | 2.1 | (64.9) | (5.28) | 0.0 | N/A | N/A |
| 12/18e | 1.7 | (121.8) | (7.47) | 0.0 | N/A | N/A |
| 12/19e | 1.0 | (238.5) | (13.92) | 0.0 | N/A | N/A |

Note: *PBT and EPS are normalised, excluding amortisation of acquired intangibles, exceptional items and share-based payments.

## First patient dosed in 2X-121 Phase II trial

On 26 June 2018, OV announced the initiation of its Phase II 2X-121 study with the dosing of its first patient (of the 30-patient recruitment goal) with mBC selected by its 414-gene 2X-121 DRP algorithm. The primary endpoint of the open-label trial is overall tumour response according to RECIST at more than 24-weeks post-treatment. Top-line data are expected in H220. We expect the results of this trial to elucidate whether the DRP can prospectively identify responders to 2X-121.

## Receives orphan drug designation for dovitinib

OV has also recently announced that it has received orphan drug designation from the FDA for the development of dovitinib (in-licensed from Novartis in January 2018) for the treatment of adenoid cystic carcinoma (ACC). ACC is a rare cancer of secretory glands and is associated with high metastases and historically poor response rates to systemic therapies. OV plans to further refine its dovitinib DRP biomarker to identify patients highly likely to respond to the drug.

## Forthcoming merger expected in September 2018

OV has announced that its merger with MPI, which the board of directors approved in late May, will occur in September 2018. It expects the last trading day for OV shares will be 31 August 2018. Post-merger, the combined entity will comprise 50.3m shares and current OV shareholders will own 51% of the new company.

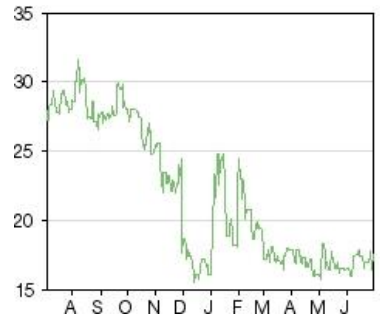
## Valuation: SEK830.2m or SEK60.02 per share

Our valuation of OV remains unchanged at SEK830.2m or SEK60.02 per share based on a risk-adjusted NPV analysis of each in-licensed anticancer drug. Based on our estimations, we value the 2X-121 programme at SEK9.64 per share of OV. We expect to add the new dovitinib indication to our valuation if the company initiates a trial for ACC. Each programme is in Phase II development and therefore has significant financing needs (SEK610m by 2020) to bring all six of its anticancer programmes to Phase III out-licensing.

**2 July 2018**

| | |
|---|---|
| **Price** | **SEK17.50** |
| **Market cap** | **SEK242m** |
| | US$0.12/SEK |
| Net cash (SEKm) as of 31 March 2018 | 40.1 |
| Shares in issue | 13.8m |
| Free float | 67% |
| Code | OV.SS |
| Primary exchange | AktieTorget |
| Secondary exchange | N/A |

### Share price performance




| % | 1m | 3m | 12m |
|---|---|---|---|
| Abs | 6.1 | (1.7) | (36.1) |
| Rel (local) | 4.9 | (1.9) | (30.1) |
| 52-week high/low | SEK31.5 | | SEK15.5 |

### Business description

Oncology Venture is a Denmark-based biopharmaceutical company focused on oncology. Its patent-protected mRNA-based drug response predictor platform enables the identification of patients with gene expression highly likely to respond to treatment. To date the company has in-licensed six drug candidates with the intent to conduct focused Phase II clinical trials and then out-license the revamped drugs.

### Next events

| | |
|---|---|
| Last trading day of OV shares prior to merger with MPI | August 2018 |
| Randomised Phase II LiPlaCis trial initiation | 2018 |
| Phase II LiPlaCis trial top-line data | H119 |

### Analysts


Nathaniel Calloway +1 646 653 7036

Maxim Jacobs +1 646 653 7027

healthcare@edisongroup.com

Edison profile page

## First mBC patient dosed in 2X-121 Phase II trial

On 26 June 2018, OV announced the initiation of its open label Phase II study of 2X-121 as a single agent in patients with mBC, with the dosing of its first patient (of the 30-patient recruitment goal) in Denmark. As a reminder, 2X-121 is an orally bioavailable small molecule and a dual PARP-1/2 and TNKS-1/2 inhibitor (previously named E7449, in-licensed from Eisai in July 2017). PARP enzymes repair single-strand DNA breaks and since BRCA1/2 mutated cells are incapable of double-strand break repair, PARP inhibition is particularly lethal and causes genomic instability and cell death.[1]

This new trial follows previous encouraging data from a 41-patient, open-label, dose escalation Phase I study of 2X-121 as a single agent in patients with advanced solid tumours (including pancreatic, ovarian, breast, colorectal, lung and other cancers), along with development and preliminary testing of the 414-gene 2X-121 DRP algorithm in 13 patients. The results were recently presented at the American Society of Clinical Oncology (ASCO) annual meeting in June. The maximum tolerated dose was identified as 600mg, which maintained PARP inhibition at approximately 90%. The 2X-121 DRP identified responders and non-responders with median overall survival of more than 800 days and 208 days, respectively. It is important to note this trial included cancers without regard to BRCA mutation status, where PARP inhibitors are more active.

Based on these results, OV will use its 2X-121 DRP to select the top 10% of patients with mBC who are highly likely to respond to the drug. Once selected to participate in the trial, patients will receive 600mg of 2X-121 orally, in a 21-day cycle. The primary endpoint of the trial is overall tumour response according to RECIST at more than 24-weeks post-treatment. The secondary endpoints include progression free survival, duration of response and overall survival (OS). OV is in possession of 13,000 capsules for initial studies. Additionally, the laboratory in Europe that will be running the DRP test is established with approximately 1,400 DRP screened patients with breast cancer, while the US lab is undergoing Clinical Laboratory Improvement Amendments (CLIA) validation. Top-line data are expected in H220. We expect the results of this trial to elucidate whether the DRP can prospectively identify responders to 2X-121.

## Dovitinib receives orphan drug designation for ACC

Also in June, OV announced that it has received orphan drug designation from the FDA for the development of dovitinib for the treatment of ACC. As a reminder, OV in-licensed dovitinib, an oral tyrosine kinase inhibitor (TKI) that inhibits fibroblast growth factor (FGF), vascular endothelial growth factor (VEGF) and platelet-derived growth factor (PDGF) receptors from Novartis in January 2018. OV's initial aim was to develop the drug and its DRP to identify patients with locally advanced or metastatic renal cell carcinoma (RCC) and liver cancer most likely to respond to treatment.

ACC is a rare, aggressive, and often indolent form of adenocarcinoma that typically originates in secretory glands such as the major and minor salivary glands of the head and neck. ACC can also occur in the trachea, lacrimal gland, breast, skin, and vulva,[2] although origination at these sites is less common. According to the National Cancer Institute, more than 1,220 patients in the US are diagnosed with ACC each year, or 0.4 per 100,000 men and women on an age-adjusted basis. Moreover, the disease is associated with three- and five-year relative survival rates of 87.4% and 55.3%, respectively.[3] Treatment for localised ACC includes surgical resection of the tumour

1 Dziadkowiec, K N (2016). PARP inhibitors: review of mechanisms of action and BRCA1/2 mutation targeting. PrzMenopauzalny 15(4), 215–219.

[2] The Oral Cancer Foundation.

[3] Ko, Y.H., et al. (2007). Prognostic factors affecting the clinical outcome of adenoid cystic carcinoma of the head and neck. *Japanese Journal of Clinical Oncology, 37(11),* 805-811.

followed by postoperative radiotherapy. Due to the high rate of distant metastases[4] and historically poor response rates of metastatic or recurrent ACC to chemotherapy,[5] a number of alternative systemic therapies have been investigated, such as combination chemotherapy with platinum, hormonal therapy, immunotherapy, and biologic agents, including targeted HER-2, EGFR, and c-kit therapies.[6] Several TKIs have also been investigated in the treatment of ACC, most notably, Sutent (sunitinib, Pfizer), Nexavar (sorafenib, Bayer) as well as dovitinib (Exhibit 1). However, only minimal activity has been found and there are currently no approved drug regimens for ACC. The strength in OV's protocol lies in the ability of the dovitinib DRP to identify responders to the drug, which may improve outcomes.

**Exhibit 1: TKIs for the treatment of ACC**

| Drug | No. of patients | ORR | Median OS (months) |
|---|---|---|---|
| Sutent | 14 | 0% | 18.7 |
| Nexavar | 23 | 11% | 19.6 |
| Dovitinib | 35 | 6% | 22.1 |
| Dovitinib | 32 | 3% | NR |

Source: Chintakuntlawar et al. (2016).[7] Notes: ORR= overall response rate; OS= overall survival; NR= not reported.

OV first plans refine its dovitinib DRP biomarker to identify patients highly likely to respond to dovitinib using an ample amount of data provided by Novartis. We then expect future trials to elucidate whether the dovitinib DRP can identify responders with ACC to the drug. If the company decides to pursue this indication in parallel to RCC and liver cancer, it could increase the value of the asset as well as hedge on potential shortcomings of the other programmes.

## Valuation

Our valuation of OV remains unchanged at SEK830.2m or SEK60.02 per share, derived from a risk-adjusted NPV analysis on the future earnings of six active clinical programmes; as standard practice, this includes costs associated with each asset (Exhibit 2). We expect to add the new dovitinib indication to our valuation if the company initiates a trial for ACC. OV has announced that it has the option to buy back 35% of the shares in its incorporated subsidiary OV-SPV2 (c 40% owned by OV, 10% owned by MPI, 50% owned by Sass & Larsen Aps) for $3.5m before 31 August 2018. This transaction may increase OV's stake in the programme (from 40% to 75%) and should provide significant upside given our current valuation of OV-SPV2's only asset, dovitinib. Post-merger, the combined entity will be comprised of 50.3m shares and current OV shareholders will own 51% of the new company.

[4] Spiro, R.H. (1997). Distant metastasis in adenoid cystic carcinoma of salivary origin. *The American Journal of Surgery, 174(5),* 495-498.

[5] Lagha, A., et al. (2012). Systemic therapy in the management of metastatic or advanced salivary gland cancers. *Head & Neck Oncology, 4,* 19.

[6] Chintakuntlawar, A., et al. (2016). Systemic therapy for recurrent or metastatic salivary gland malignancies. *Cancers of the Head & Neck, 1*(1).

[7] Chintakuntlawar, A., et al. (2016).

**Exhibit 2: Valuation of OV**

| Development Program | Indication | Clinical stage | Prob. of success | Launch year | Launch pricing | Peak sales ($m) | rNPV (mSEK) | % owned by OV | OV rNPV (mSEK) |
|---|---|---|---|---|---|---|---|---|---|
| LiPlaCis | Metastatic breast cancer | Phase II | 25% | 2023 | $91,000 | 190.6 | 388.8 | 29% | 112.7 |
| Irofulven | Prostate cancer | Phase Ib/II | 20% | 2023 | $129,000 | 52.6 | 52.4 | 100% | 52.4 |
| APO010 | Multiple myeloma | Phase Ib/II | 20% | 2023 | $143,000 | 80.9 | 81.7 | 100% | 81.7 |
| 2X-121 | Metastatic breast cancer and ovarian cancer | Phase II | 25% | 2023 | $132,000 | 116.4 | 144.7 | 92% | 133.1 |
| 2X-111 | Glioblastoma and brain metastases from breast cancer | Phase Ib/II | 25% | 2024 | $169,000 | 212.6 | 272.3 | 92% | 250.5 |
| Dovitinib | Renal and liver cancer | Phase Ib/II | 35% | 2024 | $145,000 | 152.0 | 399.0 | 40% | 159.6 |
| Total | | | | | | | | | 790.1 |
| Net cash and equivalents (as of 31 March 2018) (SEKm) | | | | | | | | | 40.1 |
| Total firm value (SEKm) | | | | | | | | | 830.2 |
| Total shares (m) | | | | | | | | | 13.8 |
| Value per basic share (SEK) | | | | | | | | | 60.02 |

Source: Edison Investment Research

# Financials

As a standalone company, our forecasts for OV model a total of SEK610m (SEK60m in 2018, SEK300m in 2019, and SEK250m in 2020) in R&D expenditure, which we record as illustrative debt, to bring all six of its anticancer programmes to Phase III out-licensing (Exhibit 3). However, following the merger, we expect MPI's cash (DKK3.3m at end FY17) to partially offset this funding requirement. Such financial requirements may be offset further via selling or out-licensing Phase III-ready drugs. These estimates are based on the expected trial cost per patient ($100,000) and Phase II clinical trial size. Our combined R&D forecasts remain unchanged, with SEK74m in 2018 and SEK194m in 2019. These costs are primarily associated with the advancement of the LiPlaCis programme into Phase IIb, ongoing irofulven and APO010 Phase IIa clinical trials. They also include 2X Oncology's recent initiation of its Phase II 2X-121 trial and its 2X-111 development programme, which is expected to initiate this year.

Due to the forthcoming merger between OV and MPI, which the board of directors approved in late May, we expect these financials to change to reflect the new entity.

## Exhibit 3: Financial summary

| SEK'000s | 2016 | 2017 | 2018e | 2019e |
|---|---|---|---|---|
| Year end 31 December | Swedish GAAP | Swedish GAAP | Swedish GAAP | Swedish GAAP |
| **PROFIT & LOSS** | | | | |
| Revenue | 1,305 | 2,091 | 1,727 | 978 |
| Cost of Sales | 0 | 0 | 0 | 0 |
| Gross Profit | 1,305 | 2,091 | 1,727 | 978 |
| EBITDA | (43,408) | (81,001) | (127,386) | (250,200) |
| Operating Profit (before amort. and except.) | (40,874) | (67,462) | (124,367) | (247,181) |
| Intangible Amortisation | 0 | 0 | 0 | 0 |
| Exceptionals/Other | 0 | 0 | 0 | 0 |
| Operating Profit | (40,874) | (67,462) | (124,367) | (247,181) |
| Net Interest | 346 | 2,588 | 2,562 | 8,674 |
| Other (change in fair value of warrants) | 0 | 0 | 0 | 0 |
| Profit Before Tax (norm) | (40,528) | (64,874) | (121,804) | (238,507) |
| Profit Before Tax (IFRS) | (40,528) | (64,874) | (121,804) | (238,507) |
| Tax | 6,985 | 7,114 | 13,357 | 26,154 |
| Deferred tax | 0 | 0 | 0 | 0 |
| Profit After Tax (norm) | (33,543) | (57,760) | (108,448) | (212,353) |
| Profit After Tax (IFRS) | (33,543) | (57,760) | (108,448) | (212,353) |
| Average Number of Shares Outstanding (m) | 10.1 | 10.9 | 14.5 | 15.3 |
| EPS - normalised (ore) | (332.94) | (527.74) | (746.66) | (1,392.43) |
| EPS - IFRS (SEK) | (3.33) | (5.28) | (7.47) | (13.92) |
| Dividend per share (ore) | 0.0 | 0.0 | 0.0 | 0.0 |
| **BALANCE SHEET** | | | | |
| Fixed Assets | 19,767 | 45,384 | 44,517 | 42,784 |
| Intangible Assets | 18,885 | 44,633 | 43,766 | 40,747 |
| Tangible Assets | 624 | 485 | 467 | 1,753 |
| Other | 258 | 266 | 284 | 284 |
| Current Assets | 38,450 | 33,830 | 34,777 | 142,882 |
| Stocks | 316 | 9,149 | 10,540 | 10,540 |
| Debtors | 6,841 | 2,593 | 4,868 | 9,533 |
| Cash | 18,872 | 11,978 | 10,417 | 113,857 |
| Other | 12,421 | 10,110 | 8,952 | 8,952 |
| Current Liabilities | (11,820) | (32,461) | (38,901) | (56,600) |
| Creditors | (11,820) | (32,461) | (38,901) | (56,600) |
| Short term borrowings | 0 | 0 | 0 | 0 |
| Long Term Liabilities | 0 | 0 | (60,256) | (361,282) |
| Long term borrowings | 0 | 0 | (60,256) | (361,282) |
| Other long term liabilities | 0 | 0 | 0 | 0 |
| Net Assets | 46,397 | 46,753 | (19,864) | (232,217) |
| **CASH FLOW** | | | | |
| Operating Cash Flow | (36,066) | (48,216) | (98,463) | (195,273) |
| Net Interest | 346 | 0 | 0 | 0 |
| Tax | 0 | 0 | (1,682) | 0 |
| Capex | 882 | (8) | (2,557) | (1,286) |
| Acquisitions/disposals | (2,296) | (19,943) | 0 | 0 |
| Financing | 39,523 | 60,702 | 39,457 | 0 |
| Dividends | 0 | 0 | 0 | 0 |
| Other | 0 | 0 | 0 | 0 |
| Net Cash Flow | 2,389 | (7,465) | (63,245) | (196,560) |
| Opening net debt/(cash) | (16,786) | (18,872) | (11,978) | 51,664 |
| HP finance leases initiated | 0 | 0 | 0 | 0 |
| Exchange rate movements | (303) | 571 | (397) | 0 |
| Other | 0 | 0 | 0 | 799 |
| Closing net debt/(cash) | (18,872) | (11,978) | 51,664 | 247,425 |

Source: Company reports, Edison Investment Research. Note: Financial summary reflects OV as a single entity, ahead of proposed merger with MPI.

Edison is an investment research and advisory company, with offices in North America, Europe, the Middle East and AsiaPac. The heart of Edison is our world-renowned equity research platform and deep multi-sector expertise. At Edison Investment Research, our research is widely read by international investors, advisers and stakeholders. Edison Advisors leverages our core research platform to provide differentiated services including investor relations and strategic consulting. Edison is authorised and regulated by the Financial Conduct Authority. Edison Investment Research (NZ) Limited (Edison NZ) is the New Zealand subsidiary of Edison. Edison NZ is registered on the New Zealand Financial Service Providers Register (FSP number 247505) and is registered to provide wholesale and/or generic financial adviser services only. Edison Investment Research Inc (Edison US) is the US subsidiary of Edison and is regulated by the Securities and Exchange Commission. Edison Investment Research Pty Limited (Edison Aus) [46085869] is the Australian subsidiary of Edison. Edison Germany is a branch entity of Edison Investment Research Limited [4794244]. www.edisongroup.com



Frankfurt +49 (0)69 78 8076 960
Schumannstrasse 34b
60325 Frankfurt
Germany

London +44 (0)20 3077 5700
280 High Holborn
London, WC1V 7EE
United Kingdom

New York +1 646 653 7026
295 Madison Avenue, 18th Floor
10017, New York
US

Sydney +61 (0)2 8249 8342
Level 12, Office 1205
95 Pitt Street, Sydney
NSW 2000, Australia