Avacta

An Investor's Introduction to pre|CISION™ Chemotherapies

Next generation chemotherapies activated in the tumour

February 2020

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Introduction to pre|CISION Chemotherapies

Chemotherapies are indiscriminate; their effectiveness is limited by side-effects and tolerability for patients. Despite that, the total chemotherapy market will be worth >$50bn by 2024.

Avacta's pre|CISION™ technology, developed in partnership with Tufts University, allows existing chemotherapies to be modified so that they are only activated in the tumour, sparing healthy tissues from damage and improving safety.

The market for a range of safer chemotherapies, that are proprietary to Avacta, is expected to be multiples of the current chemotherapy market size because patients can be treated for longer and a wider group of patients will be eligible.

Avacta has a significant near-term value inflection point arising from phase I clinical trial of the first pre|CISION™ drug starting in 2020 with the potential for a license deal either pre-clinically or with early positive clinical data.

Avacta is based in Wetherby and Cambridge UK and listed on the London Stock Exchange (AVCT) with ~£50M market capitalisation.

The Current Chemotherapy Market

Total chemotherapy market is estimated to be $56.5bn by 2024 (CAGR 11.50%)[1] driven by increased cancer detection rates

Key Players
Sanofi (France),
Novartis (Germany),
Pfizer Inc. (U.S.),
Eli Lilly & Company (U.S.),
ImClone Systems Inc. (U.S.),
GlaxoSmithKline (U.K),
AstraZeneca (U.K),
Schering-Plough (U.S.),
Boehringer Ingelheim (Germany)

Multiple Different Drug Classes
Alkylating Agents
Mitotic Inhibitors
Antimetabolites
Topoisomerase Inhibitors
Antitumor Antibiotics

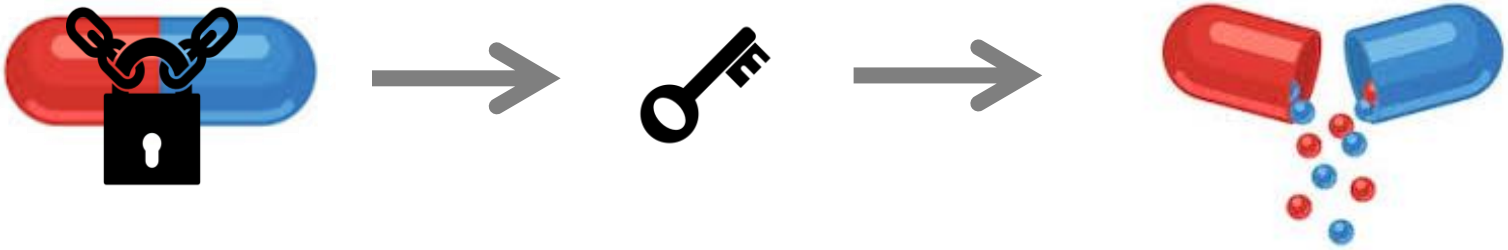
>20 different chemotherapies are currently approved

The problem with all chemotherapies is that the whole body is exposed to the drug killing healthy cells as well as cancer cells leading to serious or life threatening side effects which limit their effectiveness

1. https://www.marketresearchfuture.com/reports/chemotherapy-market-5791

pre|CISION™ Targeted Chemotherapy

Avacta's proprietary pre|CISION™ chemotherapies are modified to only activate in the tumour minimising the exposure of healthy tissues and reducing toxic side effects



Avacta's pre|CISION™ technology is a chemical modification to the chemotherapy that makes it inactive and harmless when injected into the patient

An enzyme, which is only present in the tumour, activates the chemotherapy

The chemotherapy is only activated in the tumour killing cancer cells but reducing side effects in healthy tissues

Lead Programme: AVA6000 Pro-Doxorubicin

Avacta's lead pre|CISION™ chemotherapy programme (AVA6000 Pro-doxorubicin) addresses a significant unmet need and could create a multi-billion dollar market

Existing Doxorubicin Market

- Doxorubicin has been the standard of care treatment for over 40 years for patients with advanced soft tissue sarcomas (ASTS).
- However, patients are taken off treatment after six cycles, even if they are experiencing clinical benefit, due to cumulative toxicity which leads to irreversible heart failure.
- As a result, median progression free survival for ASTS patients is approximately 6 months, with median overall survival of 12-15 months.
- This severe heart toxicity limits the drug's effectiveness AND therefore limits the size of the doxorubicin market, but it is still nearly $1bn[1].
- **A safer form of doxorubicin would permit more cycles of treatment per patient, and use of the drug with older patients with heart problems, so the market for AVA6000 pro-doxorubicin is expected to be several $bn.**

1. Global liposomal doxorubicin market: $910m (2018) and is expected to reach $1.41bn by the end of 2025 (6% CAGR)

Lead Programme: AVA6000 Pro-Doxorubicin

AVA6000 is harmless until it enters the tumour dramatically reducing the exposure of the heart to the active drug and reducing cardiotoxicity

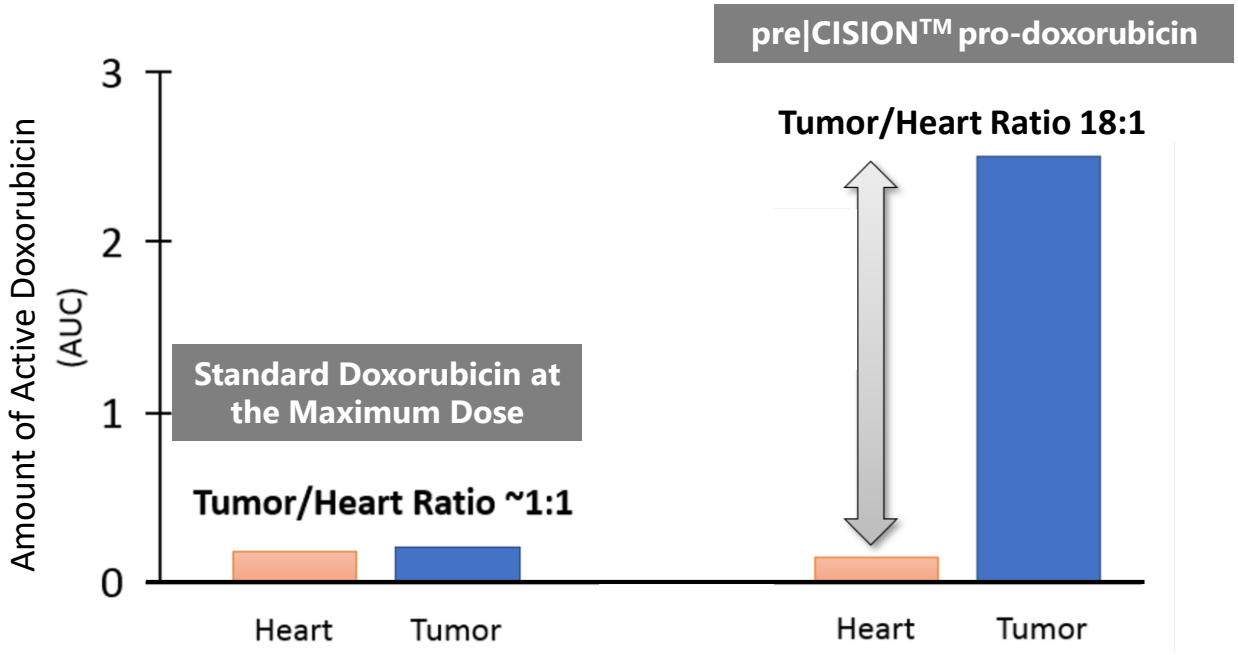
AVA6000 pro-doxorubicin

- In animal studies :
  - The maximum tolerated dose of AVA6000 >6x that of standard doxorubicin
  - The amount of activated drug found in the tumour is 18 x higher than that found in the heart which dramatically improves the safety of the treatment

- **Avacta expects to enter clinical trials of AVA6000 in the second half of 2020 and to have initial read-out before the end of the year**
- **A positive outcome for the phase I study would be to show an improved safety profile at the normal dose level for doxorubicin so the hurdle is low.**
- **Early positive indications of improvements in safety should lead to significant licensing opportunities for AVA6000 and other pre|CISION chemotherapies.**

AVA6000 Pro-doxorubicin Selectively Delivers Doxorubicin to the Tumour

pre|CISION™ pro-doxorubicin has been shown in mouse models to be activated predominantly in the tumour dramatically reducing the exposure of the heart tissue

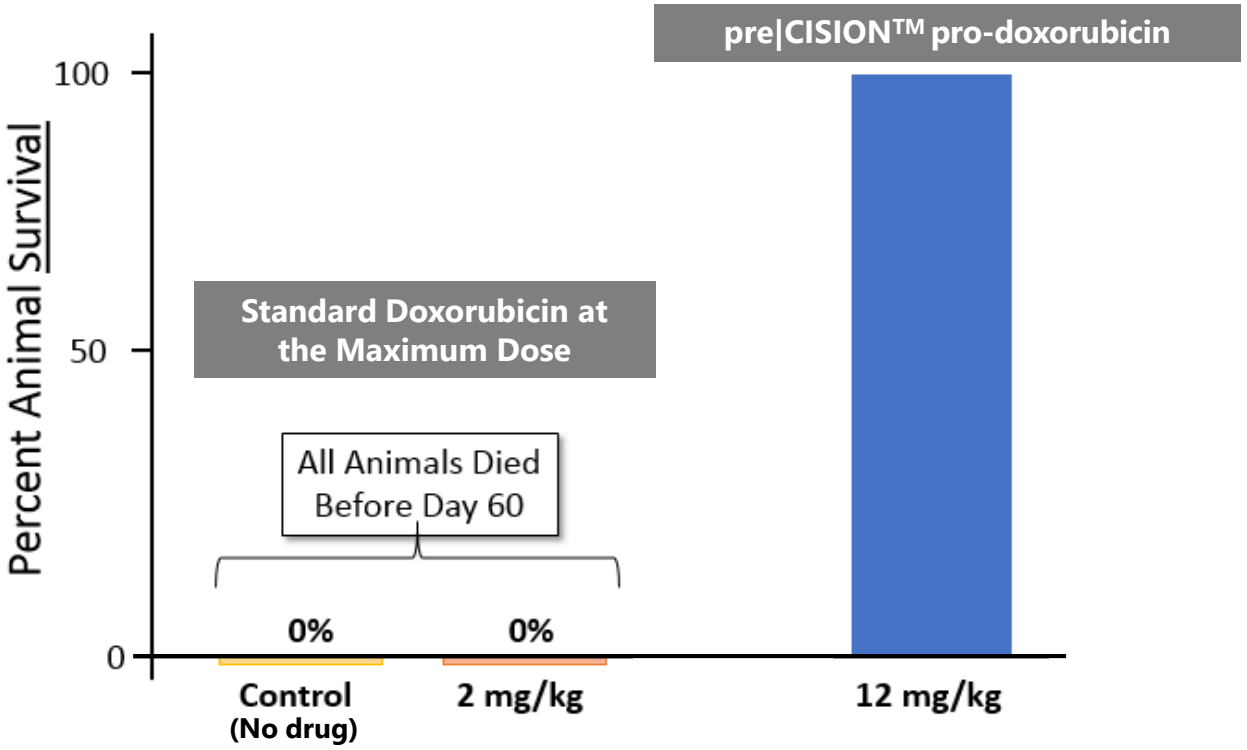


In the case of standard doxorubicin the heart receives same exposure as tumour

In the case of AVA6000 18x more active doxorubicin is found in the tumour compared with the heart

AVA6000 Pro-doxorubicin Efficacy

In a mouse model of cancer pre|CISION™ pro-doxorubicin results in 100% survival at 60 days



AVA6000 Potential Partnering Opportunities

Companies with Ongoing Clinical Studies Incorporating Doxorubicin

Large pharma testing combinations of antibodies/ receptor traps with doxorubicin (including liposomal Dox) e.g.

- **Involving PD-L1/PD-1 Inhibitors**
  - **AstraZeneca/Medimmune, BMS, Merck, Roche/Genentech, Pfizer**
- **Involving Other Checkpoint Inhibitors**
  - **BMS**: Ipilimumab (anti-CTLA-4)
  - **AstraZeneca/Medimmune**: Tremelimumab (anti-CTLA-4)
- **Companies with Other Ongoing Doxorubicin Clinical Studies of Note**
  - **Roche, Biocon and/or Mylan**: Trastuzumab (anti-HER2)
  - **Genentech**: Bevacizumab (anti-VEGF-A)
  - **Eli Lilly/Merck KGaA**: Cetuximab (anti-EGFR)

Companies with Existing Doxorubicin Products

Companies with sales forces and relevant doxorubicin commercialization experience and contacts. e.g.

- **Approved Generic Doxorubicin HCl**
  - Brand Names: Adriamycin, Adriamycin RDF, Rubex, Adriamycin PFS
  - **Most notable companies include BMS, Pharmachemie and Abraxis**
- **Approved Liposomal Doxorubicin Formulations**
  - Brand Names: Doxil, Dox-SL, LipoDox, Evacet, Nudoxa, Myocet
  - **Most notable companies include J&J, Sun Pharma, Teva**

Potential Deal Structure

- $m in upfront and development milestones
- Market approval should be rapid (~3 years) because doxorubicin is an established drug
- Low to mid-single digit royalties on anticipated $bn sales

Expansive pre|CISION Pro-drug Pipeline

The pre|CISION technology can be applied to a broad range of other chemotherapies beyond doxorubicin to improve their safety and tolerability, generating a pipeline of proprietary drugs for licensing

A pipeline of pre|CISION tumour activated pro-drugs has already been generated and substantial pre-clinical data (including PK and efficacy in a mouse model of pancreatic cancer) has been generated for a pre|CISION proteasome inhibitor:

- pre|CISION proteasome inhibitor (AVA3996)
- pre|CISION Gemcitabine
- pre|CISION Capecitabine
- pre|CISION Taxanes
- pre|CISION PARP inhibitors
- pre|CISION Platins
- pre|CISION small molecule PD-1 Inhibitor
- pre|CISION AKT inhibitors (FAP-activated MK-2206)
- pre|CISION Balixafortide

Summary

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