

## DEP® cabazitaxel progresses to phase 2 on positive results

- Phase 1 part of the DEP® cabazitaxel phase 1 / 2 trial has been successfully completed, with phase 2 to commence immediately
- Encouraging efficacy signals:
  - were observed in 67% of patients assessed to date
  - included prolonged stable disease in multiple tumour types, such as prostate cancer
  - were observed in cancers not usually responsive to conventional cabazitaxel (Jevtana®), such as ovarian cancer, and at doses lower than used for Jevtana®
- DEP® cabazitaxel patients experienced significantly fewer side effects such as nausea and bone marrow toxicity (neutropenia, anaemia, thrombocytopenia) than are typically seen with conventional cabazitaxel (Jevtana®), and no anaphylaxis or hypersensitivity reactions were observed
- Recruitment into the phase 2 part of the trial is now underway with two new trial sites being added – Imperial College London and Velindre Cancer Centre in Cardiff

**Melbourne, Australia; 10 December 2019:** Starpharma (ASX: SPL, OTCQX: SPHRY) today announced successful completion of the phase 1 component of its phase 1 / 2 trial for DEP® cabazitaxel. The trial met its objective of evaluating safety, tolerability and preliminary efficacy data, and identifying a recommended phase 2 dose of 20 mg/m<sup>2</sup>. The trial will now transition seamlessly into phase 2, with two new sites initiated and recruitment activities already underway.

The phase 1 part of the trial enrolled 14 patients with a range of cancers, including prostate, ovarian, cholangiocarcinoma and pancreatic cancer. Efficacy signals were observed in 67% of evaluable<sup>1</sup> patients and included prolonged stable disease (>47 weeks) and significant reductions in specific tumour biomarkers such as prostate specific antigen (PSA).

Efficacy signals were seen in a range of tumour types including prostate, ovarian, cholangiocarcinoma and pancreatic cancer. Furthermore, efficacy signals in prostate cancer were observed at doses up to 40% lower than usually used for standard cabazitaxel (Jevtana®). Jevtana® is approved for the treatment of prostate cancer, but ovarian, pancreatic, and cholangiocarcinoma are not currently approved indications.

These efficacy signals are particularly encouraging given all patients in the study were heavily pre-treated and had either progressed or had stopped responding to prior anti-cancer therapies to qualify for entry into the DEP® cabazitaxel study. Most patients in the trial had been previously treated with multiple cancer therapies, including taxane chemotherapies such as Taxotere®, Jevtana® (cabazitaxel), and Abraxane®, with some patients having received up to 33 cycles of treatment and up to 10 different treatments before entering the DEP® cabazitaxel trial. One prostate cancer patient who had been unable to tolerate

---

<sup>1</sup> Evaluable patients are those patients who have received ≥1 dose DEP® cabazitaxel and have had a tumour assessment conducted post treatment to determine radiological and/or biochemical response. To date, nine patients are considered to be evaluable for efficacy, and several patients are at an earlier stage of their treatment and are yet to undergo an efficacy assessment.

conventional treatment (Taxotere®) due to dose-limiting severe neutropenia received 15 cycles of DEP® cabazitaxel without neutropenia and experienced >47 weeks' stable disease.

DEP® cabazitaxel trial participants experienced significantly fewer side effects, such as bone marrow toxicity (neutropenia, anaemia, thrombocytopenia), anorexia, and vomiting, than are typically seen with Jevtana®. Participants did not require anti-nausea, antihistamine or cortisone pre-treatments, as is standard for Jevtana®. There were no cases of hypersensitivity or anaphylaxis.

Commenting on the results, Starpharma CEO, Dr Jackie Fairley, said, "We're pleased to advance our second DEP® product to phase 2, and are very excited to see the promising efficacy signals observed in such a resistant patient cohort, and the remarkably low incidence of adverse events, including bone-marrow toxicity/neutropenia, with DEP® cabazitaxel. We look forward to sharing these results with commercial partners."

Recruitment and patient screening activities are now underway in the phase 2 study and two additional trial sites in the UK are being opened, taking the total number of sites to four. These additional sites are the Velindre Cancer Centre in Cardiff and Imperial College London. Other sites are currently under consideration including in Australia.

### **Phase 1 trial results**

A total of 14 patients were enrolled into the phase 1 part of the study and received DEP® cabazitaxel at a range of doses between 2 mg/m<sup>2</sup> to 25 mg/m<sup>2</sup>. Throughout the phase 1 part of the trial, patients were treated with up to 15 cycles of DEP® cabazitaxel. Patients dosed with DEP® cabazitaxel required no steroid, antihistamine or anti-emetic pre-treatment.

#### **Efficacy Signals**

Whilst the primary objective of the phase 1 part of the trial was not a formal evaluation of efficacy, and patients were typically heavily pre-treated with other cancer agents, encouraging signs of efficacy were observed in 67% patients treated with DEP® cabazitaxel that were evaluable for treatment response. Evaluable patients are those patients who have received ≥1 dose DEP® cabazitaxel and have had a tumour assessment conducted post treatment.

The efficacy signals observed included prolonged stable disease in multiple patients and in a variety of cancer types, including prostate, ovarian, cholangiocarcinoma and pancreatic. Substantial tumour shrinkage was observed for a number of patients as well as marked decreases in specific tumour biomarkers. One patient with prostate cancer experienced stable disease for more than 47 weeks and a reduction in PSA of 79%. One stage IV ovarian cancer patient who had received more than 30 cycles of five different previous treatments (including paclitaxel) was administered seven cycles of DEP® cabazitaxel in the trial and achieved a reduction in tumour biomarker (CA-125) of 56%. One patient with stage III cholangiocarcinoma (the second most common liver cancer which is often fatal) achieved a 76% decrease in a tumour biomarker after two cycles of DEP® cabazitaxel.

#### **Safety and Tolerability**

Patients treated with DEP® cabazitaxel experienced significantly less toxicity than is usually associated with Jevtana®, including less bone marrow toxicity (neutropenia, anaemia, thrombocytopenia), anorexia and vomiting. No cases of hypersensitivity or hair-loss were observed with DEP® cabazitaxel treatment.

The vast majority of adverse events (AEs) reported were mild (grade 1). All the AEs observed with DEP® cabazitaxel are seen with conventional cabazitaxel (Jevtana®) and were

reported at a comparable or lower rate than Jevtana<sup>®</sup>. The most frequently reported AEs with DEP<sup>®</sup> cabazitaxel included fatigue, nausea, and at the highest doses, neutropenia.

The selection of the recommended phase 2 dose (RP2D) of DEP<sup>®</sup> cabazitaxel was determined taking account of the overall safety, tolerability, pharmacokinetics and preliminary efficacy results for DEP<sup>®</sup> cabazitaxel in the trial. The RP2D has been confirmed as 20 mg/m<sup>2</sup> cabazitaxel equivalents administered intravenously once every three weeks.

## Phase 2 clinical trial

The phase 2 part of the DEP<sup>®</sup> cabazitaxel trial is being conducted at multiple sites, including Guy's Hospital in London, University College London, the Velindre Cancer Centre in Cardiff and Imperial College London. Recruitment activities, including patient screening, for phase 2 have already commenced and Starpharma is also exploring opportunities to initiate further sites to expedite recruitment.

The phase 2 study is an open-label trial, with the objective of establishing anti-tumour activity (efficacy) and safety of DEP<sup>®</sup> cabazitaxel at the RP2D of 20 mg/m<sup>2</sup>. The first stage will enrol approximately 20 patients with a variety of cancers, including prostate cancer. The study will further explore efficacy in selected tumour types and recruitment numbers may be adjusted based on results in certain patient cohorts.

DEP<sup>®</sup> cabazitaxel is one of Starpharma's clinical stage DEP<sup>®</sup> assets being developed internally, alongside DEP<sup>®</sup> docetaxel and DEP<sup>®</sup> irinotecan. Starpharma's intention is to licence internal DEP<sup>®</sup> assets following clinical proof-of-concept. Starpharma also has partnered DEP<sup>®</sup> programs including a multiproduct DEP<sup>®</sup> licence with AstraZeneca, which includes the development and commercialisation of two novel oncology compounds - one of which (AZD0466, a novel Bcl2/xL inhibitor) is expected to enter the clinic shortly.

## About DEP<sup>®</sup> cabazitaxel

*DEP<sup>®</sup> cabazitaxel is a patented, detergent free, nanoparticle version of the cancer drug, Jevtana<sup>®</sup>, and is currently in phase 2. Jevtana<sup>®</sup> is a leading oncology agent used to treat advanced prostate cancer and is also under development for other cancers including testicular, ovarian, breast, and head and neck. The current (non-dendrimer) formulation of the product has US Food and Drug Administration (FDA)-mandated 'black box' warnings in relation to neutropenia, which is a major dose limiting side effect, and severe hypersensitivity (e.g. anaphylaxis) resulting from the polysorbate-80 detergent excipient used in its formulation.*

*Patients treated with conventional cabazitaxel (Jevtana<sup>®</sup>) are routinely pre-treated with corticosteroids and antihistamines to reduce the risk of life-threatening anaphylactic reactions to the excipients (detergents) present in conventional cabazitaxel. Starpharma's DEP<sup>®</sup> cabazitaxel is water soluble, eliminating the need for steroid and antihistamine pre-treatment and reduces the risk of anaphylactic reactions.*

---

## About Starpharma

Starpharma Holdings Limited (ASX: SPL, OTCQX:SPHRY), located in Melbourne Australia, is an ASX 300 company and is a world leader in the development of dendrimer products for pharmaceutical, life science and other applications.

Starpharma's underlying technology is built around dendrimers – a type of synthetic nanoscale polymer that is highly regular in size and structure and well suited to pharmaceutical and medical uses. Starpharma has two core development programs: VivaGel<sup>®</sup> portfolio and DEP<sup>®</sup> drug delivery with the Company developing several products internally and others via commercial partnerships.

**VivaGel<sup>®</sup>:** Starpharma's women's health product - VivaGel<sup>®</sup> BV is based on SPL7013, astodimer sodium, a proprietary dendrimer. VivaGel<sup>®</sup> BV for bacterial vaginosis (BV), is available for sale under the brand names Betafem<sup>®</sup> BV Gel (UK), Betadine BV<sup>™</sup> (Europe) and Fleurstat BVgel

(Australia) and a new drug application has been submitted to the US FDA. Starpharma has licensed the sales and marketing of VivaGel® BV to ITF Pharma for the US; Mundipharma for Europe, Russia, CIS, Asia, the Middle East, Africa and Latin America; and to Aspen Pharmacare for Australia and New Zealand. Starpharma also has licence agreements to market the VivaGel® condom (an antiviral condom which includes VivaGel® in the lubricant) in several regions, including Australia, Europe, Canada, China and Japan (Okamoto). The VivaGel® condom has been launched in Japan under Okamoto's 003 brand, and in Australia and Canada under the LifeStyles Dual Protect® brand. The VivaGel® condom is approved in Europe.

**DEP® - Dendrimer Enhanced Product®:** Starpharma's DEP® drug delivery platform has demonstrated reproducible preclinical benefits across multiple internal and partnered DEP® programs, including improved efficacy, safety and survival. Starpharma has three internal DEP® products – DEP® docetaxel, DEP® cabazitaxel and DEP® irinotecan - in clinical development in patients with solid tumours. Starpharma's partnered DEP® programs include a multiproduct DEP® licence with AstraZeneca, which involves the development and commercialisation of two novel oncology compounds, with potential to add more. In June 2019 Starpharma signed a Development and Option agreement with AstraZeneca for a DEP® version of one of AstraZeneca's major marketed oncology medicines.

[Starpharma.com](http://Starpharma.com) | [Twitter](https://twitter.com/Starpharma) | [LinkedIn](https://www.linkedin.com/company/starpharma)

---

#### Media

##### WE Buchan Consulting

Rebecca Wilson  
Mob: +61 417 382 391  
[rwilson@buchanwe.com.au](mailto:rwilson@buchanwe.com.au)

Arthur Chan  
+61 2 9237 2805  
[achan@buchanwe.com.au](mailto:achan@buchanwe.com.au)

##### Starpharma

Dr Jackie Fairley, Chief Executive Officer  
Nigel Baade, CFO and Company Secretary  
+61 3 8532 2704  
[investor.relations@starpharma.com](mailto:investor.relations@starpharma.com)

#### Disclosure

This ASX Announcement was authorised for release by the Chairman.

#### Forward Looking Statements

This document contains certain forward-looking statements, relating to Starpharma's business, which can be identified by the use of forward-looking terminology such as "promising", "plans", "anticipated", "will", "project", "believe", "forecast", "expected", "estimated", "targeting", "aiming", "set to", "potential", "seeking to", "goal", "could provide", "intends", "is being developed", "could be", "on track", or similar expressions, or by express or implied discussions regarding potential filings or marketing approvals, or potential future sales of product candidates. Such forward-looking statements involve known and unknown risks, uncertainties and other factors that may cause actual results to be materially different from any future results, performance or achievements expressed or implied by such statements. There can be no assurance that any existing or future regulatory filings will satisfy the FDA's and other authorities' requirements regarding any one or more product candidates nor can there be any assurance that such product candidates will be approved by any authorities for sale in any market or that they will reach any particular level of sales. In particular, management's expectations regarding the approval and commercialization of the product candidates could be affected by, among other things, unexpected trial results, including additional analysis of existing data, and new data; unexpected regulatory actions or delays, or government regulation generally; our ability to obtain or maintain patent or other proprietary intellectual property protection; competition in general; government, industry, and general public pricing pressures; and additional factors that involve significant risks and uncertainties about our products, product candidates, financial results and business prospects. Should one or more of these risks or uncertainties materialize, or should underlying assumptions prove incorrect, actual results may vary materially from those described herein as anticipated, believed, estimated or expected. Starpharma is providing this information as of the date of this document and does not assume any obligation to update any forward-looking statements contained in this document as a result of new information, future events or developments or otherwise.