



## Current Agreements

### Dealdoc

#### **Collaborative R&D agreement for single G-protein coupled receptor (GPCR) discovery program**

Sosei Heptares  
Takeda Pharmaceutical

Apr 11 2011

# Collaborative R&D agreement for single G-protein coupled receptor (GPCR) discovery program

<b>Companies:</b>	<a href="#">Sosei Heptares</a> <a href="#">Takeda Pharmaceutical</a>
<b>Announcement date:</b>	Apr 11 2011
<b>Deal value, US\$m:</b>	104.96 : sum of upfront, milestone and equity payments

- [Details](#)
- [Financials](#)
- [Termsheet](#)
- [Press Release](#)
- [Filing Data](#)
- [Contract](#)

## Details

<b>Announcement date:</b>	Apr 11 2011
<b>Industry sectors:</b>	Bigpharma Pharmaceutical
<b>Therapy areas:</b>	Central Nervous System Diagnostics » Imaging » X-ray Discovery tools
<b>Technology types:</b>	Rational drug design Screening Small molecules
<b>Deal components:</b>	Collaborative R&D Licensing
<b>Stages of development:</b>	Discovery
<b>Geographic focus:</b>	Worldwide

## Financials

<b>Deal value, US\$m:</b>	104.96 : sum of upfront, milestone and equity payments
<b>Upfront, US\$m:</b>	2.8 : sum of upfront payment
<b>Milestones, US\$m:</b>	1.6 : research-stage milestones 96.0 : additional later stage milestone payments
<b>Royalty rates, %:</b>	n/d : royalties on product sales
<b>Equity, US\$m:</b>	4.56 : investment in an equity stake

## Termsheet

29 April 2013

Heptares Therapeutics has achieved all milestones in its collaboration with Takeda Pharmaceutical Company.

By achieving these milestones, Heptares will receive a significant payment from Takeda, under the terms of the agreement signed by the two companies in 2011.

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11 April 2011

Two-year drug discovery collaboration focused on a single G-protein coupled receptor (GPCR) that plays an important role in the pathology of central nervous system disorders.

This GPCR has proved intractable using historical drug discovery efforts, due to its instability when removed from cell membranes and the resulting lack of insight into its structure.

A new medicine targeting this GPCR would be first-in-class.

During the collaboration, Heptares will leverage its proprietary StaR(R) (stabilised receptor) technology to engineer the first-ever thermally stabilised forms of the GPCR as the basis for the drug discovery programme. Heptares will also apply advanced structural biology and rational drug design approaches - including Biophysical Mapping(TM), X-ray crystallography and fragment screening - to characterise the GPCR's structure and to generate early leads.

Takeda will participate in lead generation and then assume responsibility for preclinical development and clinical development of new drugs candidates.

Takeda receives worldwide commercial rights to new drugs emerging from the collaboration.

Upon signing, Heptares received an upfront payment of GBP1.7 million and an investment in an equity stake of approximately GBP2.8 million purchased by Takeda Ventures Inc., a wholly-owned subsidiary of Takeda.

Heptares is also eligible to receive future milestone payments of up to GBP60.5 million plus royalties on product sales.

Further terms of the agreement are not being disclosed.

For future milestone payments, Heptares is eligible to receive GBP1M (GBP) in research-stage milestones and \$96M (USD) in additional later-stage milestones.

To report the total future milestone payments in the single currency of GBP, the figure reported above of GBP60.5M reflects the conversion of \$96M at a current exchange rate of 0.62, which equals GBP59.5M (GBP), plus GBP1M (GBP), which equals GBP60.5M (GBP).

## Press Release

29 April 2013

Heptares Achieves All Research Milestones and Receives Milestone Payment From GPCR Drug Discovery Agreement With Takeda Pharmaceutical Co. Ltd. (TKPYY)

4/29/2013 8:28:30 AM

WELWYN GARDEN CITY, England and BOSTON, April 29, 2013 /PRNewswire/ -- Heptares Therapeutics, the leading GPCR drug discovery and development company, announces it has achieved all milestones in its collaboration with Takeda Pharmaceutical Company. By achieving these milestones, Heptares will receive a significant payment from Takeda, under the terms of the agreement signed by the two companies in 2011.

The agreement is focused on a single GPCR target nominated by Takeda that, until now, has proved intractable to rational drug discovery efforts due to its instability when removed from the cell membranes and the resulting lack of insight into its structure. Over the course of the collaboration Heptares has leveraged its structure-based drug design (SBDD) approach to GPCRs and proprietary technologies to generate the first-ever stabilised form of the target in a clinically relevant conformation enabling a series of novel lead candidates against the target to be designed.

Tetsuyuki Maruyama, General Manager Pharmaceutical Research Division, Takeda said: "We are impressed with the efficiency and results from this partnership with Heptares. In achieving these milestones, the Heptares team has demonstrated its ability to design new, high-quality small molecules to a previously challenging GPCR target. We look forward to continuing our partnership and taking these leads forward into pre-clinical development."

"Our partnership with Takeda provides an excellent validation of our GPCR-focused structure-based drug design approach and capabilities," said Malcolm Weir, CEO of Heptares. "We see similar good progress in our other partnerships where to date we have hit every milestone. This success, in turn, provides us with an important source of capital, which has enabled us to build an impressive proprietary pipeline and provided funds to advance our first-ever selective M1 agonist into first clinical studies later this year."

Under the terms of the agreement, Takeda receives worldwide commercial rights to new drugs emerging from the collaboration. Upon signing, Heptares received an upfront payment of £1.7 million and an investment in an equity stake of approximately £2.8 million purchased by Takeda Ventures Inc., a wholly-owned subsidiary of Takeda. Heptares has also now received £1 million in research-stage milestones and is eligible to receive \$96 million in additional later-stage milestones plus royalties on product sales. Further terms of the agreement are not disclosed.

About G protein-coupled receptors (GPCRs)

The GPCR superfamily is the largest and single most important family of drug targets in the human body. It plays a central role in many biological processes and is linked to a wide range of disease areas. GPCRs are expressed in every type of cell in the body where their function is to transmit signals from outside the cell across the membrane to signaling pathways within the cell, between cells and between organ systems. There are over 375 GPCRs encoded in the human genome, of which 225 have known ligands and 150 are orphan targets. GPCRs are the site of action of 25-30% of current drugs. Six of the top ten and 60 of the top 200 best-selling drugs in the US in 2010 target GPCRs.

#### About Heptares Therapeutics

Heptares creates new medicines targeting clinically important, yet historically challenging, GPCRs (G protein-coupled receptors), a superfamily of drug receptors linked to a wide range of human diseases. Leveraging our advanced structure-based drug design technology platform, we have built an exciting discovery and development pipeline of novel drug candidates, which have the potential to transform the treatment of serious diseases, including Alzheimer's disease, Parkinson's disease, schizophrenia, migraine and diabetes. Our pharmaceutical partners include Shire, AstraZeneca, MedImmune, Morphosys, Takeda and Cubist, and we are backed by MVM Life Science Partners, Clarus Ventures, Novartis Venture Fund and Takeda Ventures. To learn more about Heptares, please visit <http://www.heptares.com>.

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11 April 2011

Heptares and Takeda Pharmaceutical Co. Ltd. (TKDG.DE) Initiate Drug Discovery Collaboration Focused on GPCR Linked to CNS Disorders; Heptares to Get GBP 4.5 Million Upfront and Up to GBP 60.5 Million 4/11/2011

CAMBRIDGE, England, April 11, 2011 /PRNewswire/ -- Heptares Therapeutics and Takeda Pharmaceutical Company today announced the formation of a two-year drug discovery collaboration focused on a single G-protein coupled receptor (GPCR) that plays an important role in the pathology of central nervous system disorders. This GPCR has proved intractable using historical drug discovery efforts, due to its instability when removed from cell membranes and the resulting lack of insight into its structure. A new medicine targeting this GPCR would be first-in-class.

During the collaboration, Heptares will leverage its proprietary StaR(R) (stabilised receptor) technology to engineer the first-ever thermally stabilised forms of the GPCR as the basis for the drug discovery programme. Heptares will also apply advanced structural biology<sup>[1]</sup> and rational drug design approaches<sup>[2]</sup> - including Biophysical Mapping(TM), X-ray crystallography and fragment screening - to characterise the GPCR's structure and to generate early leads. Takeda will participate in lead generation and then assume responsibility for preclinical development and clinical development of new drugs candidates.

Under the terms of the agreement, Takeda receives worldwide commercial rights to new drugs emerging from the collaboration. Upon signing, Heptares received an upfront payment of GBP1.7 million and an investment in an equity stake of approximately GBP2.8 million purchased by Takeda Ventures Inc., a wholly-owned subsidiary of Takeda. Heptares is also eligible to receive future milestone payments of up to GBP60.5 million<sup>[3]</sup> plus royalties on product sales. Further terms of the agreement are not being disclosed.

"We are excited to be collaborating with Takeda to unlock a key GPCR target for treating CNS disorders, an area of significant unmet medical need where Takeda has established a leading scientific and commercial position," said Malcolm Weir, CEO of Heptares Therapeutics. "As we advance Heptares' internal pipeline of GPCR-targeted medicines, we also plan to pursue attractive external opportunities, such as this partnership with Takeda, to extend our technology broadly across the GPCR universe."

"The Heptares StaR(R) technology is a powerful new capability for discovering GPCR-targeted drugs and we look forward to applying it to a specific GPCR target of interest to Takeda in the area of neuroscience," said Shigenori Ohkawa, Chief Scientific Officer at Takeda Pharmaceutical Company. "The Heptares platform applies broadly to the GPCR target family and delivers stabilised forms that most precisely capture the pharmacological conformations of GPCRs as they exist in their natural cellular environments."

[\*1] Structural biology is the combined use of molecular biology and biophysical technologies, in particular X-ray crystallography, for the elucidation of three-dimensional structures of biological macromolecules, especially proteins.

[\*2] Rational drug design approaches apply structural biology to understand in atomic detail how compounds interact with their target receptors, so they can be systematically turned into viable drug candidates by iterative medicinal chemistry.

[\*3] For future milestone payments, Heptares is eligible to receive GBP1M (GBP) in research-stage milestones and \$96M (USD) in additional later-stage milestones. To report the total future milestone payments in the single currency of GBP, the figure reported above of GBP60.5M reflects the conversion of \$96M at a current exchange rate of 0.62, which equals GBP59.5M (GBP), plus GBP1M (GBP), which equals GBP60.5M (GBP).

#### About Heptares Therapeutics

Heptares is a drug discovery company creating new medicines targeting G-protein-coupled receptors (GPCRs). The Company is currently leveraging its GPCR expertise and proprietary StaR(R) technology to build a pipeline of best-in-class and first-in-class GPCR-targeted medicines for the treatment of CNS, metabolic and other diseases.

GPCRs represent the single most important family of drug targets in the human body, yet, due to their inherent instability when removed from cell membranes, little or no structural information about these valuable targets has been available to drive structure-based drug discovery programmes. Heptares' StaR(R) (Stabilised Receptor) technology enables the first-ever thermo-stabilisation of GPCRs. This breakthrough allows Heptares scientists to resolve GPCR structures and deploy structure-based drug discovery techniques to identify potent and selective drug candidates to previously undruggable targets.

Heptares has raised more than \$35 million from leading venture investors, Clarus Ventures, MVM Life Science Partners and Novartis Option Fund.

<http://www.heptares.com>

About Takeda Pharmaceutical Company

Located in Osaka, Japan, Takeda is a research-based global company with its main focus on pharmaceuticals. As the largest pharmaceutical company in Japan and one of the global leaders of the industry, Takeda is committed to strive towards better health for patients worldwide through leading innovation in medicine. Additional information about Takeda is available through its corporate website, <http://www.takeda.com>.

## **Filing Data**

*Not available.*

## **Contract**

*Not available.*