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Interview - 2016's biggest fundraiser on a Mission



[Madeleine Armstrong](#)

It might be surprising to learn that the largest biopharma venture capital funding round this year – so far – has gone to a preclinical-stage company. Perhaps even more surprisingly, it went to a UK group. But the Cambridge University spin-off Mission Therapeutics has bucked the prevailing funding trends, reeling in £60m (\$87m) in February.

And, although the group is active in the ever-popular area of oncology, its lead compound is primarily being developed for the less trendy Parkinson's disease. Maybe it helps that its candidates target deubiquitylating enzymes (DUBs), which Mission describes as a "hitherto intractable drug class" and potentially the "next kinase area".

"People have been trying to drug DUBs for the last 10-15 years," Mission's chief executive, Anker Lundemose, tells *EP Vantage*. "And we've come up with a brand new chemistry platform, which is probably our secret if there is any secret."

Mission's platform can address "a number of DUBs", he says, which is useful when there are "a hundred DUBs, and they are involved in different things. So depending on where they're involved in disease processes you can target different DUBs to get to specific responses."

DUB be good to me

Mission has a pipeline of three oral small molecules that act on DUBs. The first candidate targets USP30, which has roles in mitophagy – the selective degradation of mitochondria – and apoptosis. Defective mitophagy has been linked with Parkinson's disease.

USP30 inhibition could also be useful in cancer, Mission believes, as it has been shown to sensitise cells to BCL2 inhibition – setting it up for a potential combination with drugs that stimulate apoptotic pathways, the company says.

Mission hopes to start first-in-human studies by the end of 2017 or early 2018, depending on how quickly it can carry out the preclinical programme, Mr Lundemose says.

He believes that Mission has the most advanced USP30-targeting compound. A search on *EvaluatePharma* does not turn up any results, though other companies including Proteostasis Therapeutics and Progenra have preclinical projects that act on other USPs, including USP7, which Mission is also looking at.

There could be more candidates in development, says Mr Lundemose. "Big pharma do not disclose where they are. And I've seen other companies with USP30 projects, but very, very early stage," he adds.

Mission's USP

Mission's cash will also fund phase I development of the next compound in its pipeline. This is about three months behind the USP30 inhibitor, says the chief exec, and is the one targeting USP7, which is involved in cancer. The DUB has various effects, but perhaps the most intriguing is that it has been implicated in controlling the suppressive capacity of regulatory T cells.

"There's a clear potential to combine USP7 inhibitors with checkpoint inhibitors – and maybe other immunology approaches," says Mr Lundemose. "Maybe some of the non-responders to checkpoint inhibitors will have their tumours infiltrated with regulatory T cells."

These cells damp down immune response, so inhibiting them should "put the immune system into overdrive" and help it fight off cancer. "There is of course a risk of generating auto-immune reactions," Mr Lundemose concedes, but adds: "That's also the case for drugs on the market right now. We haven't seen a lot of that, but it is a risk. Given the effect of these drugs, there is a risk and reward here."

Rounding out Mission's pipeline is an agent targeting the oncogene UCHL1. The group believes that inhibiting

this DUB could be anti-proliferative or induce apoptosis of cancer cells.

Right now, Mission is not looking for a partner for its USP30 or USP7-targeting agents, but is “exploring potential partnerships on other DUBs”, Mr Lundemose says.

In any case, it will need to pass phase I and probably show efficacy in phase II if it wants to attract a buyer. Mr Lundemose is not fazed by the prospect of carrying out another fund raising: “I think if you’ve got the right ideas and the right set-up, I’m sure you can raise money, even a lot of money.”

He does not see any disadvantage of being a UK-based company. “On the contrary, I think the UK has a very vibrant biotech sector.”

Mission’s latest funding round, led by Imperial Innovations and Woodford Patient Capital Trust, and including investment from Roche’s and Pfizer’s venture arms, was certainly impressive. It will be a while until we know if the DUB-targeting strategy lives up to its promise, but the area is already generating excitement.

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