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Juno looks east



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As of yesterday China has a new CAR-T player – JW Biotechnology – and this one is backed by none other than Juno Therapeutics. The new venture also counts on the local expertise of Wuxi Aptec, and is a clear attempt to funnel Juno’s adoptive cell therapy projects into the local market.

Given China’s large population and appetite for novel science this makes perfect sense, though the healthcare system’s ability to fund these complex therapeutics is a major unknown. And, while few might realise this, the Chinese CAR-T market is actually relatively competitive (see table below).

Last year Cellular Biomedicine Group threw its hat into the ring through a deal with the Chinese PLA General Hospital, which was already running studies with CARs directed against CD19, CD20, CD30, EGFR, CD33 and CD138 in haematological as well as solid tumours ([A move to roll up China’s cell therapy market, February 11, 2015](#)).

However, Cellular shortly afterwards came under [pressure from allegations over its disclosure](#), and in the past year its stock, which trades on Nasdaq, has lost about half its value.

Carsgen Therapeutics is another local company, and claims to have a pipeline of seven CAR-T projects, including two – targeting GPC3 and EGFR – against hepatocellular cancer and glioblastoma respectively in clinical trials at Renji Hospital. In total Clinicaltrials.gov reveals no fewer than 33 active CAR-T trials in China.

CAR-T clinical trials in China

Hospital	Corporate partner	Antigens studied	Number of trials	Note
Chinese PLA General Hospital	Cellular Biomedicine Group	CD19, CD20, CD30, CD33, CD133, CD138, meso	8	-
Southwest Hospital	-	CD19, CD20, CEA, Her2	4	-
Fuda Cancer Hospital	-	CD19, Her2, EphA2	3	-
Xinqiao Hospital of Chongqing	-	CD19, CD22	3	NCT02685670 compares CD28 vs 4-1BB co-stim domains. NCT02652910 uses memory-enriched cells.
Peking University	-	CD19, CD30	3	4th generation CAR with self-withdrawal mechanism
Renji Hospital	CARSgen	EGFR, GPC3	2	-
Renji Hospital	Shanghai GeneChem	GPC3, meso	2	Uses transcatheter arterial infusion
Anhui General Hospital of Armed Police	PersonGen Biomedicine	Muc1	2	-
First Hospital of Jilin University	Beijing Doing Biomedical	CD19	2	Allogeneic $\gamma\delta$ T-cells used in NCT02656147
Second Military Medical University	-	CD19	1	-
Shanghai Changhai Hospital	Shanghai GeneChem	CD19	1	Includes use of donor-derived T cells
Shanghai Tongji Hospital	-	CD19	1	-
Shenzhen Second People's Hospital	-	CD19	1	-

It should be noted that the list includes not only the obvious targets – CD19-expressing leukaemias, for instance – but also solid tumours, as well as novel CAR constructs and enriched cell populations. Targeting CD22 for CD19-negative relapses, as Xinqiao Hospital of Chongqing is doing, mirrors Juno's own JCAR018.

The entry of a heavyweight like Juno is bound to shake up the market, though for now nothing has been disclosed about what clinical studies are planned.

Joint venture

JW has been set up as a 50/50 joint venture between Juno and Wuxi, and will be able to license CAR-T and engineered T-cell receptor candidates from Juno's pipeline for local development, backed by Wuxi's knowledge of the Chinese healthcare system and alliances with hospitals there.

Whether many in China will be able to afford a CAR-T therapy can be questioned, but this is an attractive market because studies can be run cheaply – the above trial activity bears this out – and regulatory hurdles are low. The world's first gene therapy, Gendicine, and first oncolytic virus, Oncorine, were approved in China, in 2003 and in 2005 respectively.

Wuxi mainly operates as a contract research organisation. In 2011 the group launched a VC arm, Wuxi Healthcare Ventures, and this business was actually an early investor in Juno; clearly the Chinese group saw

something it liked.

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