ADVERTISING FEATURE

Advances in biotech

Lower cholesterol treatment breakthrough

The American offshoot of Australian biotech Noxopharm, Nyrada, believes it is within reach of achieving a major advance in the treatment of cardiovascular disease.

It has made important progress with a drug candidate known as NYX-330 that Nyrada believes may be the next breakthrough medication for heart attack and stroke.

NYX-330 is designed to lower cholesterol levels by inhibiting the action of a protein known as PCSK9 which has become one of the most highly valued targets in the pharmaceutical world since its discovery about 13 years ago.

A drug that successfully inhibits this protein has been hailed as potentially rivalling the $US12 billion annual sales a few years ago of the anti-cholesterol drug, Lipitor, the biggest-selling drug the world has seen.

PCSK9 has become so important because it is now understood to be the reason why the "statin drug", the key cholesterol-fighting drugs, don't work as well as they should in many people.

Having a combined treatment with a statin drug and another drug to block PCSK9 function is what is driving a major race in the pharmaceutical industry to find a PCSK9-inhibitor that doctors and patients will embrace.

Owen Dempsey, US-based executive director of Nyrada and biotech entrepreneur, explained the size of the opportunity, with about one in four Americans over the age of 45 (about 32 million men and women) now taking statin drugs and accounting for why this is the biggest drug category in the world with combined sales last year of $US19 billion.

"As good as statins are, they can do with extra help to bring cholesterol levels down to ground-floor levels in most people," he says.

"The opportunity we are chasing is a drug that could become a standard co-treatment with statins to deliver those desired levels. A co-treatment to a $US19 billion market is a very substantial market."

Dr Graham Kelly, who is chairman of Nyrada and managing director of Noxopharm, explained the science behind PCSK9.

"PCSK9 works by holding cholesterol in the bloodstream, slowing down its removal from the blood," he says.

"That's a normal function. The problem comes when our bodies make too much PCSK9. The result is reduced clearance resulting in higher cholesterol levels in blood.

"We now know that one of the consequences of statin therapy is an increase in PCSK9 levels, a normal response on the body's part to less cholesterol being produced in the body."

The discovery of PCSK9 in 2005 triggered a major push by the pharmaceutical giants to develop a PCSK9 inhibitor that could be given in conjunction with a statin drug.

It was a simple rationale – the statin drug would reduce the amount of cholesterol being made in the body, and the anti-PCSK9 drug would mean that what cholesterol was made would be more readily removed from the blood.

A treatment with the same features as the statins – convenient, daily, affordable, oral – was the goal.

That goal hit early snags, with a general switch to developing alternative treatments based on large molecule drugs (monoclonal antibodies), two of which came to market in 2015 – Repatha (Amgen) and Praluent (Regeneron-Sanofi).

"Two very large clinical studies using Repatha or Praluent have now proved that combining them with statins delivers significant health benefits with blood cholesterol levels falling about 60 per cent more than statins alone," says Dempsey.

"But despite that proven benefit, use of these two drugs tends to be restricted to very high-risk patients. One reason is practical, with the drugs needing to be injected every two or four weeks.

"The second is cost, with a cost for unsubsidised patients of about $US14,000 per year on an ongoing basis. These are not inconsiderable market challenges and we believe that NYX-330 overcomes these challenges."

Kelly explained the science behind the development of NYX-330.

"A private Australian company headed by Dr Ian Dixon and assisted by three Australian chemists created the breakthrough," he says.

"Using proprietary drug design software, they identified an area on the PCSK9 molecule that provided a suitable landing site for a small molecule. NYX-330 is the result of that pioneering science.

"NYX-330 blocks the ability of PCSK9 to bind to the cholesterol receptor. That means more receptors available to remove cholesterol from the blood and that equals lower blood cholesterol levels.

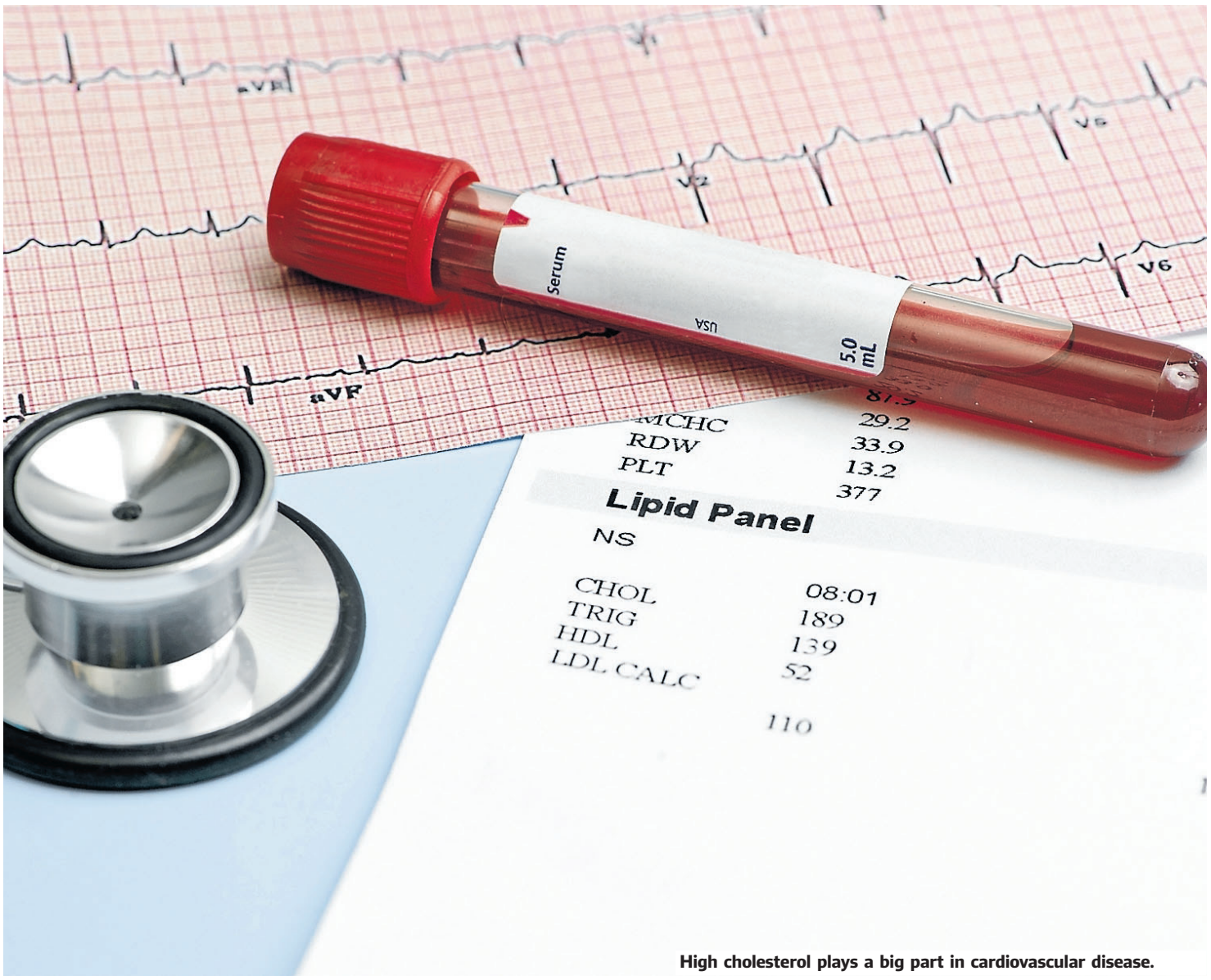
"We are confident that we have a PCSK9 inhibitor with the potential to meet the goals of a convenient, oral, once-daily treatment at an affordable cost."

NYX-330 is undergoing studies in France and elsewhere designed to optimise its function, with an anticipated 15-18 months before it will be ready to bring into the clinic.

Nyrada Inc is a US-based biotechnology company. It was spun out of Noxopharm in 2017 to take advantage of the interest of the US capital market in biotech investment.

Noxopharm currently owns 67 per cent of Nyrada and Dr Dixon, through an investing entity, owns 33 per cent of Nyrada.

Senior management, including a chief executive officer and board, will be based in the US. Nyrada raised $4 million through Australian 708(8) investors in February 2018.



High cholesterol plays a big part in cardiovascular disease.

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