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NTU grows mini kidneys in lab to study potential therapies

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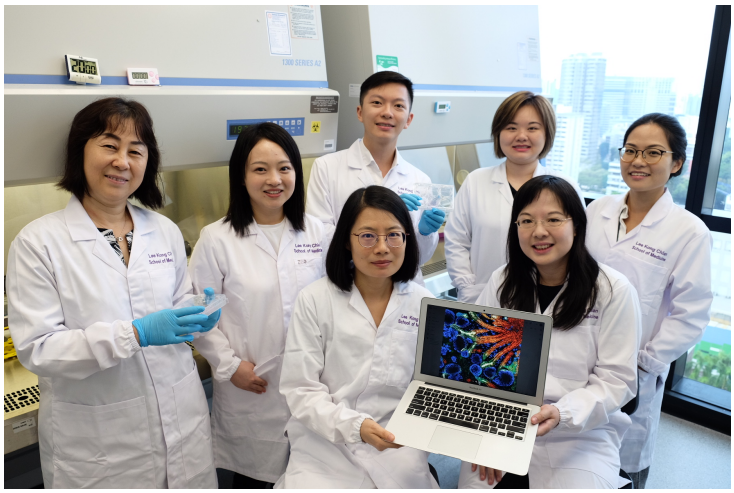
To better understand how kidney diseases develop in individual patients



An international team of researchers led by Nanyang Technological University, Singapore (NTU Singapore) has grown 'miniature kidneys' in the laboratory that could be used to better understand how kidney diseases develop in individual patients.

The mini kidneys, known as kidney organoids, were grown outside the body from skin cells derived from a single patient who has polycystic kidney disease, one of the most common inherited causes of kidney failure in adults.

The researchers reprogrammed these cells to obtain patient-specific pluripotent stem cells, which, under the right conditions, can develop into kidney organoids similar to human foetal kidneys in the first three to six months of development.

The kidney organoids developed by Asst Prof Xia and her team may also offer new insights into human kidney development, which currently cannot be studied in depth due to concerns surrounding human stem cell research.

The mini kidneys may also be used to better understand the development of nephrons in the kidney. The number of nephrons at birth is inversely correlated with incidence of hypertension and kidney failure later in life. Being born with a high nephron number appears to provide some degree of protection against these conditions.