

# Testing urine for particular proteins could be key to preventing kidney transplant failure

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Testing for molecular markers in the urine of kidney transplant patients could reveal whether the transplant is failing and why, according to research presented at the 27th European Congress of Clinical Microbiology and Infectious Diseases (ECCMID).

Transplants are life-saving treatments for [patients](#) with end-stage [kidney](#) disease but around 25% fail within five years, either because the body begins to reject the new organ, or because a viral infection has taken hold of the kidney. The two problems require diametrically opposite treatments but often, by the time the cause of the failure is confirmed, it is too late to prevent it.

The new research suggests that the two problems could be distinguished from each other via the detection of cocktail of proteins shed from the kidney into the patient's urine. The research could form the basis of a [urine test](#) to pick up early signs of [transplant failure](#) and ensure the correct treatment is given.

The study was presented by Dr Ibai Los-Arcos, predoctoral fellow in the Vall d'Hebron Research Institute and with a Rio Hortega Contract in the [infectious diseases](#) department at the Hospital Universitari Vall d'Hebron, Barcelona, Spain. He explains: "Kidney transplant patients are given immune suppressing drugs to prevent their bodies from rejecting the donor organ, but this is a balancing act. If treatment is insufficient, the organ can be destroyed by the immune system. On the other hand, too much suppression can allow an infection to take hold. Often by the

time we know which is happening, it's too late to save the organ."

The study focused on a [virus](#) called BK. The BK virus causes a common infection which most people experience during childhood mainly with no symptoms. Following infection the virus remains in the body, lying dormant in the kidneys and urinary tract. However, when transplant patients are given immune suppressing drugs, the virus can reactivate, infecting and destroying the new kidney. This usually happens within two years of the transplant.

The research was a pilot study in four Spanish hospitals involving 30 [kidney transplant patients](#). Ten of the patients had been diagnosed with T-cell mediated acute rejection (TCMR), meaning the kidney was being rejected. Another ten had been diagnosed with BK virus nephropathy, meaning the virus was destroying the kidney. The other ten patients had no known problems with their transplanted kidneys (stable graft).

Dr Los-Arcos and his colleagues analysed urine samples from each patient to find out which proteins were present. Most of the proteins they found are known to come from the human body. However, in those with the viral infection, they were able to detect proteins that are known to come from the BK virus. These were not found in samples from patients with TCMR or with a stable graft.

When they looked more closely at the human proteins, the researchers also found that they could use the levels of those proteins to differentiate between patients who had TCMR, BK virus nephropathy or a stable graft.

Dr Los-Arcos told the congress: "If we can confirm these results in a prospective validated cohort of patients, we may be able to develop a urine test to indicate when a kidney transplant is failing, and at a much earlier stage. More importantly, it would be able to differentiate whether

it is failing because of the BK virus or because of organ rejection. If that's the case, we will be able to choose the correct treatment to address the problem and hopefully have more successful kidney transplantations.

Patients in the study were already having kidney biopsies because of suspected [transplant](#) failure. Now the researchers want to carry out a larger study where they test patients soon after transplantation to see if the test can pick up the very early signs of failure. At the same time, they are working to develop a simple and inexpensive testing kit that could be used to measure the key proteins in [urine samples](#), which could be available within a few years.

The study was designed and developed by Dr Joan Gavaldà and Dr Oscar Len from the Hospital Universitari Vall d'Hebron. The [protein](#) analysis was performed by the proteomics laboratory directed by Dr Francesc Canals from Vall d'Hebron Institut of Oncology. The study was carried out within the Spanish Network for Study of Infection (REIPI) with a grant from the Spanish Ministry of Health.

**More information:** Abstract no: EP0341, Determination of BK virus nephropathy biomarkers in urine samples from kidney transplant recipients by proteomics, 12:30, Sunday and 23 April, ePoster Arena 1

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