Researchers from the EPSRC-funded Nanoscale Physics Research Laboratory (NPRL) at the University of Birmingham, have developed a nanoscale device which can diagnose prostate cancer with more accuracy than current tests.

Prostate cancer is the most common cancer for men in the UK: over 10,000 men die from it every year. The ‘i-screen’ biochip, a new screening device based on nanotechnology, will help doctors to diagnose the cancer earlier and with one hundred times more accuracy.

**IMPACT ON HEALTHCARE**

- After undergoing expensive and painful biopsies two thirds of men discover that they have a benign form of prostate cancer. Unlike the current test, the ‘i-screen’ can accurately diagnose the benign form, preventing a great deal of expense, pain and anguish.

- Current blood tests for prostate cancer are relatively expensive and slow to process. The ‘i-screen’ aims to provide a low cost, on-the-spot, accurate test, enabling doctors to diagnose the cancer early and monitor it regularly.

**Nanotechnology to the rescue**

Over 30,000 men are diagnosed with prostate cancer in the UK every year, equivalent to roughly one diagnosis every 15 minutes. Unfortunately many of these diagnoses come too late.

Now university spin-out company Inanovate’s ‘i-screen’ biochip, could help doctors diagnose the disease accurately and spot the cancer in its earliest stages. The device isn’t on the market yet, but will begin regulatory approval procedures soon.

The ‘i-screen’ is based on a novel mass spectrometer, developed by NPRL and patented in 1995, which can select atomic clusters (nanoparticles) of specific size. By 2000 scientists at NPRL started to use this mass filter technology to immobilise and orientate protein molecules.

**Instant and accurate diagnosis**

In 2005 Inanovate was set up and work began on developing a biochip which scans a very small blood sample, searching for the marker proteins associated with prostate cancer. It consists of a surface patterned with many thousands of nanoscale structures, each of which ‘anchors’ a protein of choice.

Compared to current tests for prostate cancer, the ‘i-screen’ is low-cost, accurate (100 times more sensitive than current tests), fast and simple to use. The aim is for doctors to be able to give an on-the-spot diagnosis and follow the progress of the cancer with regular checks. And it isn’t just prostate cancer diagnosis that the ‘i-screen’ could revolutionise. If the appropriate marker molecules can be found, many other illnesses could benefit from being diagnosed this way. Currently Inanovate are looking for partners to help them develop an ‘i-screen’ biochip for lung and ovarian cancers.

For more information about EPSRC and the impact it is making visit www.epsrc.ac.uk
ACCURATE, LOW-COST, ON-THE-SPOT DIAGNOSIS FOR PROSTATE CANCER PATIENTS