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Early warnings

Screening programmes for cancer detection are not always as effective at saving lives as might be hoped. Improving the situation will require a concerted effort on a broad front.

Early detection of cancer is broadly seen as key to successful treatment, but many screening programmes are coming under fire for being relatively ineffectual. On 18 March, for example, *The New England Journal of Medicine* published online two studies of screening programmes for prostate cancer, which look for the biomarker prostate-specific antigen (PSA). One found that the screening programme had no effect on mortality rates for prostate cancer (G. L. Andriole *et al. N. Engl. J. Med.* **360,** 1310–1319; 2009), the other found that screening reduced the rate of death from prostate cancer by 20% but was associated with a high risk of overdiagnosis (F. H. Schröder *et al. N. Engl. J. Med.* **360,** 1320–1328; 2009). Both found that a large number of men received unnecessary medical treatment as a result of the screening programmes.

Hard on the heels of these studies came another that looked at the gene-expression profile of ovarian cancers detected early, and found that they would probably advance more slowly and be less deadly than those detected later. If screening is to succeed, the authors conclude, we need other, better tests that can detect the virulent forms earlier (A. Berchuck *et al. Clin. Cancer Res.* **15,** 2448–2455; 2009). Then earlier this month, researchers reported that screening for ovarian cancer by measuring levels of the protein CA125 and performing transvaginal ultrasound detected mostly advanced cancers, not the early-stage tumours that could presumably be treated more effectively (E. Partridge *et al. Obstet. Gynecol.* **113,** 775–782; 2009).

These studies highlight a problem that has also been seen in other cancers, such as breast and lung: slower-growing cancers are easier to detect, but less likely to be fatal, precisely because they are less aggressive. But the early stages of more virulent cancers still elude today's tests, which themselves can bring risks when false-positive results lead to unnecessary medical interventions.

It is clear that, although some screening programmes are very effective at saving lives — cervical and breast cancer being prime examples — many others are not. This doesn't mean that early detection is worthless, simply that some current methods are not as good as they could be.

Researchers are now trying to improve tests by gaining a better molecular understanding of cancer. They are looking for biomarkers that can distinguish aggressive tumours from slow-growing ones (see http://tinyurl.com/naturecancer). They are studying the cancer genome to devise better screening tests and more targeted therapies (see page 719). And they are learning how to give doctors genetic information to guide the use of drugs in the clinic (see *Nature* **458,** 131–132; 2009).

"The early stages of more virulent cancers still elude today's tests."

A better molecular understanding of cancer is unlikely to cure cancer on its own. For example, scientists are still unravelling the complex biology of angiogenesis inhibitors, which once promised to starve tumours to death by choking off their blood supply. Researchers have now found that the drugs can actually increase the spread of cancer in mouse models in certain situations (see page 686). And although the researchers hope that their studies will eventually lead to better angiogenesis inhibitors, the fact remains that every previous cancer 'breakthrough' — be it a targeted therapy or a marker for early detection — has also hit roadblocks.

Given that reality, the best strategy is to continue working on a broad front, improving these methods along with every other intervention in the cancer-fighting tool kit — even those that seem outside a basic biologist's remit. Nobel laureate Roger Tsien at the University of California, San Diego, for example, is trying to devise probes that could light up tumour cells to help surgeons do a more thorough job of removing them. Helping surgeons probably doesn't hold the same appeal for basic biologists as discovering a groundbreaking cancer pathway. But it may be that the most effective treatments for cancer will come, not from some major conceptual breakthrough, but from the steady refinement of the tools we already have. ■

Tough climate

The US National Academy of Sciences faces a difficult balancing act over global warming.

The US Congress has put the National Academy of Sciences (NAS) in an awkward position. In asking for the academy's advice on what to do about global climate change, it has left the NAS with a difficult balancing act if the academy wants to be effective and remain respected.

The question of efficacy is in large part a matter of timing: things are moving very quickly in the climate arena, and the political world won't necessarily wait for the academy's methodical review. In the past two weeks, for example, as the NAS was gathering information on the science and policy of climate change at a high-level workshop in Washington DC, two congressmen — Henry Waxman (Democrat, California) and Edward Markey (Democrat, Massachusetts) — introduced a 648-page bill that would commit the United States to a cap-and-trade programme to curb greenhouse-gas emissions. In Bonn, Germany, meanwhile, international negotiators were meeting as part of the lengthy process of hammering out a climate treaty, which is expected to be adopted in Copenhagen this December.

The NAS study committee, under the banner of America's Climate Choices, is not scheduled to release its first set of findings until the