

In This Issue

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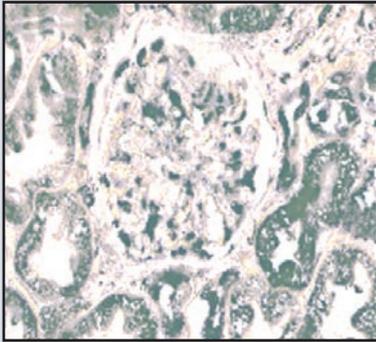
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Novel kidney protein powers the heart and blood pressure In addition to regulating fluid and electrolyte balance, the kidney also functions as an endocrine organ, secreting proteins that have important and widespread biological roles. In this issue, Jianchao Xu and colleagues report on their search for novel proteins secreted by the kidney. The researchers have identified a new protein, renalase (pages 1275–1280). Renalase is an amine oxidase secreted by the kidney into the blood to regulate heart rate and blood pressure. Interestingly, plasma levels of renalase are markedly reduced in patients with end-stage kidney disease as compared to healthy subjects. Therefore, there may be a causal link between reduced renalase and the increased cardiovascular risk that is often seen in patients with renal disease. The identification of renalase not only provides a more complete understanding of renal and cardiovascular physiology but could also lead to the development of novel therapies for patients with chronic kidney disease. A big fat contribution to breast tumor growth Increased adipose mass is associated with an elevated risk of breast cancer, but in the past, little was known about how fat cells actually contribute to carcinogenesis. In this issue, Philipp Scherer and others aim to identify factors that are both secreted by adipocytes and present in breast cancer stromal tissue pages 1163–1176). In particular, the researchers [...]

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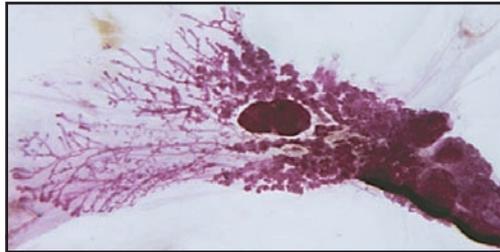




Novel kidney protein powers the heart and blood pressure

In addition to regulating fluid and electrolyte balance, the kidney also functions as an endocrine organ, secreting proteins that have important and widespread biological roles. In this issue, Jianchao Xu and colleagues report on their search for novel proteins secreted by the kidney. The researchers have identified a new protein, renalase (pages 1275–1280). Renalase is an amine oxidase secreted by the kidney into the blood to regulate heart rate and blood pressure. Interestingly, plasma levels of renalase are markedly reduced in patients with end-stage kidney disease as compared to healthy subjects. Therefore, there may be a causal link between reduced renalase and the increased cardiovascular risk that is often seen in patients with renal disease. The identification of renalase not only provides a more complete understanding of renal and cardiovascular physiology but could also lead to the development of novel therapies for patients with chronic kidney disease.

A big fat contribution to breast tumor growth



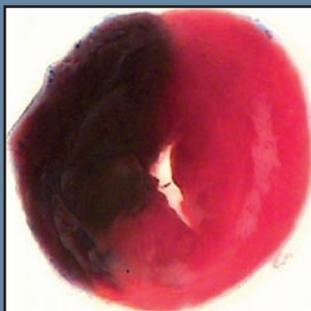
Increased adipose mass is associated with an elevated risk of breast cancer, but in the past, little was known about how fat cells actually contribute to carcinogenesis. In this issue, Philipp Scherer and others aim to identify factors that are both secreted by adipocytes

and present in breast cancer stromal tissue (pages 1163–1176). In particular, the researchers focus on the adipocyte-derived collagen VI and show that it is a critical factor that promotes early tumor growth within the mammary microenvironment *in vivo*. The authors show that collagen VI encourages proliferation and survival of malignant cells and that mice that lack collagen VI have significantly reduced tumor growth. The authors show substantial enrichment of a C terminal fragment of collagen VI on the surface of human breast tumor cells. The same fragment exhibited powerful growth-stimulatory effects on breast cancer cells *in vitro*. This study provides the first evidence that the extracellular matrix protein collagen VI can modulate tumor behavior and offers a potential link between the epidemiological association of increased adipocyte mass and breast cancer.

New vaccine bids bye-bye to bacteria

Pseudomonas aeruginosa is a bacterium that can cause respiratory tract infections, which can be life threatening in patients who have cystic fibrosis. In this issue of the *JCI*, Stefan Worgall, Ronald Crystal, and colleagues report their use of a novel strategy to create a genetic vaccine against *P. aeruginosa* (pages 1281–1289). The researchers used a modified adenovirus vector vaccine that expresses a region of the outer membrane of *P. aeruginosa*, called OprF, which was previously recognized as a promising vaccine candidate. Immunization of mice with this vaccine induced antibody production and protected the mice after exposure to a deadly dose of the bacteria. Importantly, the mice could repeatedly be given the vaccine, and after each vaccination, the immune response against *P. aeruginosa* was boosted. Normally, adenovirus vectors cannot be used for repeated infection. The finding that a vaccine against *P. aeruginosa* is therapeutic in mice offers promise for patients with cystic fibrosis or other disorders that prevent them from effectively fighting off respiratory tract infections. These results may also be useful in the development of vaccines against other bacterial pathogens.

Nitrite says NO to ischemia-reperfusion injury



Nitrite is a simple inorganic anion that is the end product of nitric oxide (NO) oxidation and that was previously thought to exhibit only limited biological activity. In this issue, David Lefer, Mark Gladwin, and colleagues report that nitrite is a potent inhibitor of ischemia-reperfusion (I/R) injury in the liver and heart (pages 1232–1240). The researchers showed that nitrite therapy conferred a dose-dependent cytoprotective effect in mouse models of I/R injury, limiting cell death and infarct size and preserving organ function. These effects are NO dependent. The data demonstrate that nitrite could be used therapeutically for I/R disease, as it is already known that nitrite is safe; it is an approved treatment for cyanide poisoning. Nitrite therapy could potentially be used to prevent organ dysfunction following I/R injury to the heart or vasculature resulting from surgery or transplantation. Nitrite may also serve as an endogenous protective mechanism that protects cells from severe stress.