KIDNEY DISEASE

A bacterial substitute for a kidney

Nat. Biomed. Eng. https://doi.org/10.1038/s41551-020-0582-1 (2020).

An orally delivered microbial 'cocktail' can metabolize nitrogenous waste products in the blood and substitute for dialysis in animal models of kidney injury.

Kidney failure results in an increased buildup of toxic waste products and commonly requires dialysis, which seriously affects quality of life. Alternative strategies for replicating the functions of the kidney are needed.

Zhang et al. design an orally delivered microbiome micro-ecosystem that degrades intestinal nitrogenous waste. The administration of this in mouse and pig models of kidney injury shows that it could successfully diminish nitrogenous waste. *HS*

https://doi.org/10.1038/s41591-020-1027-9

CANCER

Trying out personalized therapy in NSCLC

Nature https://doi.org/10.1038/s41586-020-2481-8 (2020)

The majority of therapies for non–small-cell lung cancer (NSCLC) are tailored to cancer drivers associated with light exposure to tobacco smoke, but this represents around 20% of those affected by lung cancer. Therapies that are effective in tobacco-associated NSLC are thus badly needed.

The National Lung Matrix Trial in the UK is an umbrella study in which patients with NSLC are stratified according to mutations identified by genome sequencing of their tumor and are assigned therapies. The authors of the trial screened 5,467 patients, of which 2,007 were eligible for entry into the trial due to their mutations, and 302 received genotype-matched therapy. The results thus far show that there are a limited number of genotype-matched combinations that show promise and that these are in people with limited tobacco exposure *HS*

https://doi.org/10.1038/s41591-020-1028-8

VACCINE DEVELOPMENT

Seeds of hope in COVID-19 vaccine preliminary data

Lancet https://doi.org/10.1016/S0140-6736(20)31605-6 & https://doi.org/10.1016/S0140-6736(20)31604-4 (2020); *N. Engl. J. Med.* https://doi.org/10.1056/NEJMoa2022483 (2020)

Two approaches for vaccines against COVID-19 are safe, suggest the induction of relevant immune responses and will be pursued further.

The COVID-19 pandemic has necessitated the rapid development of a vaccine against the causative coronavirus SARS-CoV-2 and has resulted in the acceleration of new technologies.

One approach to the vaccine is to inoculate people with viral vectors that express the spike protein of SARS-CoV-2, and another is to use an mRNA encoding the spike protein. A group in China using an adenovirus-vectored vaccine reports the results of a phase 2 trial of 508 people, and a group in Oxford reports a phase 1/2 trial of a chimpanzee adenovirus-vectored vaccine in 1,077 people. A phase 1 trial of an mRNA-based approach in 45 people has been also been reported. All trials indicate good safety and potential to take the vaccine to the next stage. *HS*

https://doi.org/10.1038/s41591-020-1031-0

METABOLISM

Intermittent fasting passes trial

Cell Metab. https://doi.org/10.1016/j.cmet.2020.06.018 (2020)

Time-restricted feeding results in caloric-intake reduction, weight loss and improved cardiometabolic measures.

Time-restricted feeding, or intermittent fasting, in which a person eats only during a short period of the day, has gained in popularity as a healthy approach to weight loss and results in an improvement in cardiometabolic risk factors, although it is yet to be assessed in a rigorous clinical trial.

Cienfuegos and colleagues carry out a randomized clinical trial of 4-hour and 6-hour restricted feeding, and a control diet, over 8 weeks in a group of 58 participants with obesity. They find that restrictive feeding results in a reduction in body weight, insulin resistance and oxidative stress relative to that of control groups, indicative of the potential for the diet to result in improved health outcomes. *HS*

https://doi.org/10.1038/s41591-020-1030-1

Hannah Stower

GENE THERAPY

Opening the door to gene therapy for ALS

N. Engl. J. Med. **383**, 109–119 & 151–158 (2020)

Two studies show the potential of RNA-based gene-therapy approaches in the treatment of amyotrophic lateral sclerosis (ALS).

ALS is a neurodegenerative disease that in 10% of patients is caused by a mutation in the gene encoding superoxide dismutase 1 (*SOD1*), and targeting this gene is a therapeutic approach in development.

Mueller and colleagues use a microRNA directed against *SOD1* (AAV-miR-SOD1) to target and reduce *SOD1* expression in two patients with ALS. They find that the approach is safe and shows some clinical promise in one of the patients. In a phase 1/2 trial of 50 participants, the authors carry out intrathecal administration of an antisense oligonucleotide, tofersen, that mediates the degradation of SOD-1. The trial shows tofersen to be effective in reducing SOD-1 levels. *HS*

https://doi.org/10.1038/s41591-020-1029-7