

on the surface of natural killer cells, thereby activating these cells, and also contains a domain that binds to antigens on the tumor cells, bringing the activated natural killer cells to the tumor.

Mice that received these trispecific antibodies showed greater tumor shrinkage than those that received currently available cytotoxic therapeutic antibodies. *HS*

<https://doi.org/10.1038/s41591-019-0684-z>

MICROBIOTA

Gut-brain communication

Nat. Microbiol. **4**, 623–632 (2019)

Science **364**, eaau6323 (2019)

Adding to the growing appreciation of the gut–brain connection, a group of researchers in Belgium and Norway analyzed data from the stool microbiomes of the Belgian and Flemish Gut Flora Project cohort and the Dutch LifeLines DEEP cohort, along with information on quality of life and depression. They found that certain species of bacteria were associated with depression and quality of life and that the metabolic products were also linked to measures of mental health.

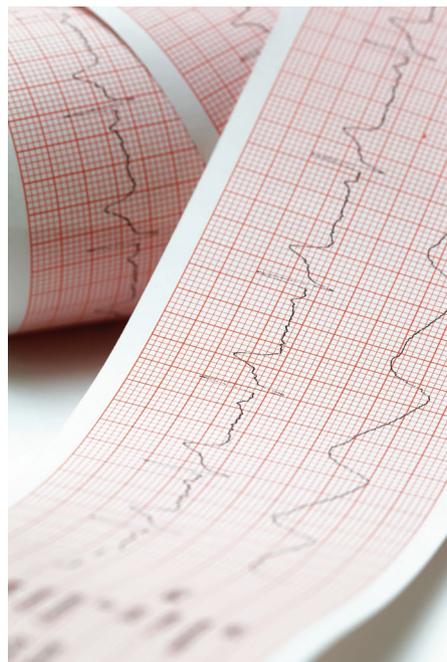
In another study, a group in the United States identified two successive metabolic pathways in human gut microbiome bacteria that metabolize the Parkinson's disease therapy L-dopa, thereby limiting its bioavailability for treatment in the brain. They identified a compound that inhibits this reaction and could be explored as a therapeutic to be given alongside L-dopa. *HS*

<https://doi.org/10.1038/s41591-019-0685-y>

CARDIOVASCULAR DISEASE

Immunotherapy for heart injury

Nature **573**, 430–433 (2019)



Credit: Mutlu Kurtbas / E+ / Getty

T cells can be programmed to help damaged hearts. Normally, an injury to the heart, such as a heart attack, activates a subclass of cells known as cardiac fibroblasts, which deposit additional extracellular matrix proteins, resulting in fibrosis, which worsens heart function and signals to cardiomyocytes, negatively impacting their function.

A group of scientists in the United States and Germany engineered T cells that identify the pathological fibroblast using a protein unique to the latter cells. They show in mice that, following heart injury, the engineered T cells are able to eliminate the fibroblasts that have gone awry in the heart and improve cardiac function. *HS*

<https://doi.org/10.1038/s41591-019-0688-8>

OBESITY

A refocus on the rural landscape

Nature **569**, 260–264 (2019)

A worldwide group of researchers known as the NCD Risk Factor Collaboration analyzed height and weight data from more than 2,000 population-based studies—encompassing 112 million adults from 1985 to 2017—to identify changes in body mass index (BMI) over this time. They found that more than 55% of the worldwide rise in mean BMI during this period could be accounted for by increases in BMI in individuals in rural areas. In some low- and middle-income countries, this contribution was more than 80%.

These results suggest that a change in approach to rural nutrition is needed. *HS*

<https://doi.org/10.1038/s41591-019-0687-9>

NEUROSCIENCE

Single-cell insights into neurology

Science **364**, 685–689 (2019)

Nature **570**, 332–337 (2019)

The advent of single-cell RNA sequencing (RNA-seq) technology has finally allowed scientists to analyze unstable RNA material in individual cells. In one notable study, Arnold Kriegstein and his colleagues carried out single-cell RNA-seq on distinct cell types from the brains of 15 individuals with autism spectrum disorder and 16 unaffected individuals. In another study, Manolis Kellis and Li-Huei Tsai and their colleagues used the same technique to analyze the brains of 48 individuals with Alzheimer's disease. Both studies found that dysregulation of specific groups of genes within specific groups of cells were connected with pathogenesis. *HS*

<https://doi.org/10.1038/s41591-019-0686-x>

Hannah Stower

HIV

Editing hope for a future cure

Nature **568**, 244–248 (2019)

Until this year, the only person known to have been cured of HIV was an individual, known as the 'Berlin patient', who received two allogeneic hematopoietic stem cell transplants following total body irradiation, all to treat his acute myeloid leukemia. The cells used in these transplants lacked CCR5 (CCR5 Δ 32/ Δ 32), a crucial HIV entry receptor leading to the cure.

This year, a person with HIV known as the 'London patient' went into remission following a single (CCR5 Δ 32/ Δ 32) allogeneic stem cell transplant without total body irradiation, indicating not only that the Berlin patient wasn't a fluke but also that cell-based cure strategies needn't be so toxic.

In parallel, scientists have been testing CRISPR technology to remove CCR5 from hematopoietic stem cells for transplant into HIV-infected individuals. A patient who was treated 19 months ago for acute lymphoblastic leukemia with these cells is alive, indicating that the approach is safe; however, the levels of CCR5 disruption in their lymphocytes are too low for them to stop antiretroviral drug therapy. *HS*

<https://doi.org/10.1038/s41591-019-0683-0>