The age of an RNA molecule (artist's impression of double-stranded RNA) can be estimated with a protocol that involves an RNA-editing protein. Credit: Laguna Design/SPL

BIOTECHNOLOGY  ·  19 OCTOBER 2020

The timestamp that can tell an RNA molecule's age — to the hour

Technique allows scientists to complete a timeline for gene activity in a single cell.
An RNA-editing tool that ‘timestamps’ RNA molecules reveals not only which genes in a cell are turned on at any one time, but also when they were turned on.
When a gene is switched on, it triggers the production of RNA molecules that carry the information needed to make a specific protein. Scientists hoping to understand a cellular process often sequence the RNA molecules present at a given moment in a single cell. But researchers have lacked a reliable way to determine when a particular gene became active.

A team led by Edward Boyden at the Massachusetts Institute of Technology in Cambridge and Fei Chen at the Broad Institute of Harvard and MIT, also in Cambridge, tagged genes with a genetic sequence that is recognized by an RNA-editing protein. After these genes had synthesized RNA, the protein made chemical changes to the molecule, adding progressively more edits over time.

When the researchers then sequenced the RNA molecules, they could assume that those with more chemical edits were older than those with fewer edits. The system can narrow down an RNA molecule’s age to within roughly one hour.

*Nature Biotechnol. (2020)*

Biotechnology

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**MORE RESEARCH HIGHLIGHTS...**

A man having a blood transfusion.

**Virology**  ·  29 July 2021

**Your blood teems with a unique set of stealthy ‘anelloviruses’**

A single individual harbours tens to hundreds of variants of this DNA-based virus, which can move from one person to another in donated blood.
A grim future awaits many children with type 2 diabetes
Long-term follow up finds that more than half of children and adolescents with the disease develop complications within 15 years of diagnosis.

A caffeine buzz gives bees flower power
Bumblebees dosed with caffeine can more easily remember the scent of sugar-heavy blossoms.

Mini ‘metavehicles’ zip and swerve on light power
Light can be used to both propel and steer tiny vehicles made with materials that have distinctive optical properties.

The unnoticed eye motions that help us see the world
Eye movements lasting only a few hundredths of a second create an information-laden ‘smear’ on the retina.
Far-off planet has a nursery for baby moons
Researchers spy a dusty, moon-forming disk surrounding a planet beyond the Solar System.

Toxic mercury rides rivers into the sea
Research suggests that rivers are a bigger source of mercury in coastal waters than is the atmosphere — a finding that contradicts some global models.

Rubbish-raiding parrots take lessons from co-conspirators
Sulphur-crested cockatoos are the first parrots known to have complex culture centred on food-gathering.

A telescope watches as a black hole spews stuff into space
The trailblazing collaboration that first imaged a black hole turns its sights on a nearby black-hole jet.
The surprising place where pot farming first blossomed
Humans first began cultivating cannabis, a source of both fibres and drugs, some 12,000 years ago.

How to win big for the climate: rein in the ‘super polluters’
Just 5% of the world’s power plants account for almost three-quarters of carbon emissions from electricity generation.

The guts of a ‘bog body’ reveal sacrificed man’s final meal
Tollund Man, who lived more than 2,000 years ago, ate well before he was hanged.

Pikas in high places have a winter-time treat: yak poo
Snacks of faeces help the pocket-sized mammals survive the cold and wind atop a vast plateau that abuts the Himalayas.
Tied in knots: Zika virus tangles are the most stable RNA known
A dangerous virus uses a ring-shaped structure to make its RNA resistant to attack.

Why a meat-free diet boosts health: protein levels might hit the spot
An analysis shows that the amino-acid profiles of vegan, vegetarian and omnivorous diets are similar.

China wastes almost 30% of its food
Out-of-home dining accounts for some of the nation's wasted food, but much more is lost during food storage and processing.

While you sleep, a device harvests energy from your sweaty fingertips
An energy collector in contact with the skin is efficient enough to power some electronic devices.
Damage to a royal town on the Danube warns of seismic danger
Documents and physical evidence hint that a major earthquake struck Visegrád in Hungary, once home to kings.

Why breastfeeding is becoming less reliable for birth control
As countries become more prosperous, people nursing their babies become fertile sooner after birth.

Destructive fires serve as pest control for lizards
Mediterranean lizards in burnt areas are less likely to be afflicted by mites than their neighbours in unburnt woodlands.