NextGen’s tools for the future

In January, we asked young scientists to name and describe a currently nonexistent invention that would make them more effective scientists. We heard from hundreds of scientists from dozens of countries. They described inventions that streamlined bench work, organization, communication, literature review, article writing, and idea generation. A sample of their responses can be found below.

To allow for as many voices as possible, in some cases we have printed excerpts of longer submissions (indicated by ellipses) and lightly copyedited original text for clarity. To read the complete versions, as well as many more, go to http://scim.ag/NG14R. Follow Science’s NextGen VOICES survey on Twitter with the hashtag #NextGenSci.

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Matthew Kruger

School of Biological Sciences, Washington State University Vancouver, Vancouver, WA 98686, USA. E-mail: Matthew.kruger@email.wsu.edu
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Brendan J. Hussey
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Wei Wang
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Dissect-O-Matic
Dissect biological samples automatically!

Introducing the Dissect-O-Matic! Tired of endless hours with eyes scrunched and back hunched over a dissection microscope? Then this is the device for you! The newly designed Dissect-O-Matic is a fully automated system to dissect, block, stain, and mount biological samples for microscopy imaging. Simply select from menu options to specify species, tissue type, and staining method, and the Dissect-O-Matic will take it from there! This ergonomic instrument may even be interfaced to your microscope to fully automate the next stage of specimen imaging for a truly streamlined, carefree research experience!

Mailea R. Miller-Pierce
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cell submarine
Look inside a living cell!

...Bring your favorite cell a little closer with the first Cell Submarine. Aliquot one Cell Submarine into your cell culture dish. The Cell Submarine, equipped with a fluorescent-detecting camera, will begin beaming back images from inside the cell. This nanoscale sub can navigate through channels to seek out your favorite cell components. Cell Submarine can be directed using your phone as a remote.

Blair Roszell
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Mailea R. Miller-Pierce
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false positive detector
Detect spurious results!

Scientists traditionally accept a 5% chance that a statistically significant result is actually a false positive. That means 1 out of 20 findings is deceptively spurious, luring scientists down twisted paths lined with failures to replicate, wasted money, and lost time. Why take that 5% chance when the false positive detector can be a life-saver.

Masha G. Savelieff
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AUTOSYRINX DARTS
Collect blood from free-ranging animals!

Field workers: Do you find yourself day-dreaming about serum samples from your free-ranging study subjects? With the AutoSyrinx, your daydream just became a reality! Our patented darts flip the function of dart guns on its head: Instead of putting a dart’s contents into the animal’s bloodstream, this device fills its lightweight barrel with a sample of the animal’s blood! After extraction, which takes place nearly instantaneously, the dart ejects itself; the lightweight body of the round barely perturbs the animal being sampled.

Morgan E. Chaney
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Ancient Genetic material is incredibly fragile. In an archaeological context, biological tissues are bombarded by exogenous DNA, and ultimately, human contamination. The Minimally-invasive Sample Acquisition Tool (MiSAT) combines core-drilling technology with a higher-resolution successor to modern ground-penetrating radar. Once you’ve identified a burial, MiSAT deploys a probe to extract a sample with almost surgical precision—all while preserving the stratigraphy of the site and limiting human contact before entering the lab.

Vincent M. Battista
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**Rosa Li**
Department of Psychology and Neuroscience, Center for Cognitive Neuroscience, Duke University, Durham, NC 27708, USA. E-mail: rosa.li@duke.edu

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**Predict the biological impact of molecules!**

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**Idrees Mohammed**
Department of Chemistry, New York University Abu Dhabi, Saadiyat Island, Abu Dhabi, United Arab Emirates. E-mail: dr.idreesmohammed@yahoo.com

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**Noel I. Robles**
Yuma, AZ 85364, USA. E-mail: noelroblbes177@gmail.com

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**Michael G. Kemp**
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**EPHYPANY GENERATOR**
**Connect apparently unrelated concepts!**

Who’d have thought that a light beam plus a falling elevator would lead to General Relativity? Or that magnetism plus a size-changing flask would lead to the Bose-Einstein condensate? Or that radar plus a metal container would lead to the microwave oven? The Epiphany Generator application throws concept words or pictures together, two at a time, on your screen! You make the connection. Doesn’t make sense? Move on. Something new? Bingo! To survive academically, you must be creative and nonlinear. The Epiphany Generator can help.

**Hemachander Subramanian**
Integrated Mathematical Oncology Department, Moffitt Cancer Center, Tampa, FL 33612, USA. E-mail: hemachander@gmail.com

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**THE RISK METER**
**Measure a project’s ethical repercussions!**

When conducting research, it is imperative that you remain cognizant of the potential ethical dilemmas that may arise as a consequence of your discoveries. With this simple device, you can instantaneously gauge the risk level of unethical developments stemming from your work. Simply input your concept, and the Risk Meter assigns a numerical “risk number” to your current project! Armed with this knowledge, you can proceed forward with a more complete understanding of the potential of your research. The machine also serves as a gentle reminder for the ethics and obligations associated with scientific investigation.

**Henry Zhou**
Vagelos Scholars Program in the Molecular Life Sciences, University of Pennsylvania, Philadelphia, PA 19104, USA. E-mail: henryz@sas.upenn.edu

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**THE TOWER OFbabel**
**Remove knowledge barriers!**

Interdisciplinary research has led to some of the most exciting innovations in the human history, such as quantum computing and 3D bioprinting, but is often hindered by jargon, background knowledge requirements, and experts’ inability to appreciate advances in other fields. The Tower of Babel software leverages artificial intelligence and big data analytics to mine research articles, patents, and textbooks in all fields; answer your queries pertaining to other domains in plain language; actively point out newly developed technologies potentially relevant to your studies; and update its databases automatically. This software will facilitate interdisciplinary research by removing the knowledge barriers across disciplines.

**Kun-Hsing Yu**
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**Translate research for any audience!**

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NextGen's tools for the future

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