## What is the Teen Biotech Challenge?

**TBC2018** is a webpage design contest that challenges high school students to demonstrate their understanding of biotechnology's impact on society and the importance of science and technology in addressing global challenges.

**Important Dates**

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| September 2017 | TBC2018 Contest Launch - Instructions Posted Online |
| February 1st | Sponsor Teachers Submit Registration List of All TBC Participants |
| February | Students Finish Websites and Teachers Organize School Site Judging/Selection of Finalists |
| February 22nd | SPARK Research Scholar Applications Due |
| March 22nd | Website Entries Submitted for Final Judging |
| | *(6 entries total per class/teacher, ~ one per focus area)* |
| April 12th | SPARK Research Scholar Awards Announced |
| May 7th | TBC Winners Announced Online |
| May 21st | 2018 Teen Biotech Challenge Awards Symposium at UC Davis |

**Overview**

Biotechnology is transforming our daily lives. From agriculture to medicine, biofuels to bioremediation, the products developed using advanced biological techniques span a wide range of commercial and humanitarian applications. By definition, biotechnology is the use of living cells to facilitate processes or generate products useful to humans. However, the modification of other living organisms to support the survival of humanity is not a new concept. For centuries, humans have used selective breeding of plants and animals to generate food, medicine and other useful products. The biotech innovations that we see today are the result of advances in science and technology over the last century, especially those that allow researchers to quickly analyze and modify genetic information, manipulate cellular processes and build biomaterials.

Through the Teen Biotech Challenge, we hope to promote awareness and understanding of the many ways that biotechnology positively impacts society. Participating students will gain skills in research and creative web design, while achieving recognition from peers, educators and members of the biotech community. Thanks to the ongoing support of biotech community sponsors (e.g. Bayer CropScience, Monsanto, Novozymes) and event partners (e.g. Genentech, UC Davis Biotechnology Program), we have been able to host an awards symposium and provide cash prizes and awards each year since 2005.

**Contest Logistics**

The first steps for TBC student participants in grades 9-12 are selection of a sponsor teacher and a research topic in biotechnology. Topics have been organized into six focus areas of biotech: 1) Agricultural Biotechnology; 2) Computational Biology & Genomics; 3) Drug Discovery & Biomanufacturing; 4) Environmental Biotechnology; 5) Molecular Tools; and 6) Regenerative Medicine & Biomedical Engineering. After gathering information on a biotech topic of choice, students will develop an educational webpage that includes a general introduction and timeline,

discussion of societal impact and ethical issues, examples of related biotech products and services in the global marketplace, and links to reputable resources.

During a preliminary round of evaluation organized and/or conducted by the sponsor teacher, webpage entries will be judged for adherence to contest instructions, quality of content and web design (including spelling and grammar), creativity and organization. Sponsor teachers participating in TBC as a classroom activity may use the sample judging rubric provided on the TBC contest webpage to facilitate peer group evaluations and selection of final entries (~one per focus area), or submit the six entries that score highest based on the teacher's own evaluation criteria for Final Judging. Students working on the TBC project independently must select a sponsor teacher that will not be submitting a class set of six entries.

In each of the six focus areas, first, second, third and honorable mention winners will be chosen and honored at the **2018 Teen Biotech Challenge Awards Symposium, which will be held on Monday, May 21st from ~6:30-9:30pm** at UC Davis. Winning students will be listed on the contest webpage on Monday, May 7th (*tentative date – subject to change reliant on judges need for additional review time*), and an awards notification will be distributed to sponsor teachers. Both teachers and winning students will receive an email invitation with event details following the announcement of winning entries. At the TBC2018 Awards Symposium, teachers, parents and students will have the opportunity to interact with college faculty, industry sponsors, and biotech community representatives. During the evening's program, **first place students will be asked deliver brief oral remarks (~2-3 minutes) on their biotech topic and experience building the website.** In addition to student presentations, the program will include a short keynote address or panel discussion on a biotech research topic, a few words from academic programs and sponsors of TBC, and the highlight of the evening… the awards presentations!

Winning students in each of the six focus areas will receive a certificate and/or ribbon honoring their achievement. First- and second- place winning websites will also receive cash prizes (1st - $100, 2nd - $60)* to be shared equally between team members. For example, in a second place team of three students, each student will receive $20. The grand finale of the awards program will be the selection of the grand prize winner from among the six first place awardees. The Grand Prize winner(s) will receive an honorary award, which will be announced at the end of the Awards Symposium. Winning webpages will be published on the Teen Biotech Challenge website (http://teenbiotechchallenge.ucdavis.edu/index.html), as part of an online resource for teachers, students and the public.

**SPARK Research Scholar Awards**

TBC student participants who submit a judging quality website are eligible to apply for an eight week stem cell biology summer research experience offered by the UC Davis Institute for Regenerative Cures (PI Gerhard Bauer) and funded by the California Institute for Regenerative Medicine (CIRM). More details on the program are found in the SPARK Research Scholar Award application found on the TBC website. Five awards to TBC participants will be made.

**Note: cash awards will be provided to winning students at the TBC Symposium in the form of VISA gift cards. Cash prize amounts may increase, depending on availability of donated funding for the contest*.

## Part I: Researching a Biotech Topic

**TBC2018 participants** should choose a biotech research topic from one of the six focus areas described below. Students may work individually, or as members of a team comprised of not more than three people.

**I. Agricultural Biotechnology**

Understanding the interaction between genes and the environment will help us to optimize agricultural production systems and cope with climate change. As world population grows past 7 billion, we need to find sustainable strategies to increase the quantity and quality of our food and feed supplies. Agriculture must also deliver more plant biomass, fibers, and seed oils for renewable products. Agricultural scientists are challenged to increase production yields while preserving natural resources, protecting biodiversity and dealing with the ever-shrinking availability of arable farm land and available water resources. The tools of biotechnology can be used to address challenges in agriculture by speeding up traditional methods of plant and animal breeding, helping to identify the most sustainable farming and ranching practices, and in understanding the biology of important agricultural species and ecosystems.

Possible topics for research in the Ag Biotech Focus Area include, but are not limited to:

- Crop and animal-associated microbes for health and agricultural productivity
- Post-harvest food safety (monitoring microbes that may make people sick)
- Plant and Animal Breeding Methods
    - Marker assisted selection (MAS)
    - Mutation breeding
    - Genetically enhanced or modified crops and how they are made (plant transformation, gene gun, genome editing, etc…)
        - Agronomic crop traits - Herbicide tolerance (HT), Insect resistance (IR), Disease resistance, Salt tolerance, Submergence/flood tolerance, Water use efficiency (WUE)/drought tolerance, Nitrogen use efficiency (NUE)
        - Nutritionally enhanced crops (BioCassava Plus, Golden Rice, Celiac-safe Wheat, GLA safflower, high oleic soybeans, etc…)
        - Crops that produce biomass or high value products (pharming, plant-made industrial products)
    - Genetically enhanced or modified animals
        - Fast growing salmon or other aquatic species
        - Reproductive cloning for livestock breeding
        - Genome editing to create double-muscled or hornless cattle

**II. Computational Biology & Genomics**

Computational biology or bioinformatics is the use of information technology to store, sort, analyze, share and understand biological data. Through data analysis and machine learning, scientists aim to build accurate computational models that can correctly predict biological phenomena. Similar informatics tools are used, whether one is analyzing events that occur within a single cell (ex: protein folding of a particular polypeptide) or looking at interactions in

multicellular systems (ex: a host-symbiont relationship between two species). Ultimately, the goal of computational biology is to help us understand how complex natural systems work.

Thanks to computational biology tools and genomics research, information about an individual's genome is now readily available to help tailor lifestyle choices and medical treatments. Information about our genomes will likely be incorporated into our medical records, much as family history and test results are currently compiled. So… what does this mean for the average consumer? For hopeful parents that would like healthy children? For adoptees that do not have access to ancestry information or family medical histories? For drug companies and doctors aiming to treat patients with pharmaceuticals that are highly efficacious, with few side effects? Understanding the relative contributions of genes vs. the environment to human health and well-being is a complex task, but with the emerging tools of personal genomics, we are at the dawn of a new era in medicine.

Possible topics for research include, but are not limited to:

- Personalized medicine – tailoring medical treatments to genotypes
- Direct-to-consumer genome testing (deCODE, 23andme, etc…)
- Human genetics and reproduction
    - Human cloning and "designer babies"
    - Understanding genome mutations and inheritance of genetic diseases
    - Epigenetics (environmental influence on gene expression/inheritance of traits)
- Ancestry/Human DNA profiling
    - Human ID and paternity/relationship testing
    - mitochondrial DNA and Y-chromosome analysis
    - Fetal-maternal microchimerism (relationship to human health, autoimmune disorders)
    - Understanding the genetic relationships between ancient populations of people (modern humans, Neanderthals, Denisovans and other ancient lineages)
- Genomics and evolution
    - Hologenomics – organisms evolving together
    - Metagenomics and microbiomes (plant-soil microbiome studies, Human Microbiome Project, breast milk influence on infant gut flora, etc…)
    - Tree of Life Project
    - Comparative genomics (e.g. what makes us human, compared to other primates?)
- Life science informatics (genome sequencing projects, online tools and resources [e.g.. NCBI's GenBank, MapViewer, Entrez Gene, OMIM, PubMed], etc…)
- Computer simulations of complex biological processes and systems
    - Predator-prey interactions
    - Nutrient and energy flows
    - Spread of infectious disease in a population
    - Predictive modeling of intracellular biological processes
        - Gene expression
        - Protein folding
        - Metabolic pathways

**III. Drug Discovery & Biomanufacturing**

Many types of cells, including mammalian cells, plant cells, fungi, yeast and bacteria may be genetically engineered to produce useful proteins, therapeutic drugs, vaccines, industrial enzymes and other industrial precursors through biomanufacturing. Research and development in this field generally includes the use of recombinant DNA technologies, screening of candidate organisms or molecules for appropriate activities and monitoring small scale cell culture systems. Downstream processes require an understanding of large scale fermentation systems & methods for isolating and purifying proteins and other molecules of interest. An important aspect of pharmaceutical biomanufacturing is compliance with Good Manufacturing Practices (GMPs) and cooperation with the US Food and Drug Administration (FDA) to conduct clinical trials and gain drug approvals.

Possible topics for research include, but are not limited to:

- Industrial enzymes
- "Orphan drug" development for rare genetic diseases
- Development of biologic drugs (vaccines, monoclonal antibodies, hormones, etc…) to treat autoimmune disorders, cancer, diabetes and other chronic diseases, and infectious diseases (ex: ZMapp to fight Ebola!)
- Antibiotics and new technologies to treat infectious disease
- Vaccines and therapeutics for "Neglected Tropical Diseases" (parasitic worms, leshmaniasis, Chagas disease, river blindness, African sleeping sickness, leprosy, elephantiasis, snail fever, dengue fever, etc…)
- HIV/AIDS drug discovery

**IV. Environmental Biotechnology**

Environmental biotechnology uses living cells and systems to address natural resource limitations, the need for renewable energy technologies, pollution and climate change. As technological advances in information, transportation, medicine and many other areas of human achievement require ever more electricity and liquid fuel supplies; we need to find clean, "green" sources to keep us moving! Harnessing the metabolic and photosynthetic talents of microalgae, microbes and feedstock plants, scientists are developing new liquid biofuels, such as cellulosic ethanol and biodiesel. Biofuels decrease reliance on petroleum, which is beneficial for the environment and the economy. Scientists are also looking for ways to convert the energy stored in biomass into heat and electricity, including the development of anaerobic digestion systems and microbial fuel cells.

"Green chemistry" is a field of research that aims to eliminate the use or production of hazardous substances during industrial processes. One option that green chemists pursue is the use of genetically engineered cells (algal, microbial, fungal, insect, plant, etc…) to produce bioplastics, industrial precursors and useful chemicals. Cells and organisms have been genetically engineered (or characterized for naturally occurring abilities) and used in bioremediation (clean-up of hazardous substances in soils and waterways).

Possible topics for research include, but are not limited to:

- Biofuels and Biomass conversion
    - Algal biofuels
        - Macroalgae (seaweed!) for biomass
        - Microalgae for oils and transportation fuels

    - Anaerobic digestion of biomass or "biogassification" (municipal trash, human and animal waste, agricultural waste)
    - Biodiesel
    - Cellulosic ethanol, other liquid alcohols
    - Feedstock development (specific crops for maximum biomass)
    - Microbe or enzyme engineering (to breakdown and ferment biomass)
- Bioremediation
    - Metal-accumulating bacteria and plants (arsenic, lead, palladium, etc…)
    - Microbial biodegradation of petroleum products, chlorinated organic solvents, and other contaminants
    - Phytoremediation (plants remove or degrade contaminants)
- Green Chemistry
    - Bioplastics
- Microbial fuel cells
    - Water desalinization
    - Electricity generation from biomass

**V. Molecular Tools: Nanobiotechnology, Synthetic Biology & Genetic Engineering**

The Molecular Tools focus area captures all technologies for manipulating, changing or synthesizing cellular structures or useful molecules in biotechnology. Nanobiotechnology is the use of nanoscale ($10^{-9}$) molecular systems to develop medical diagnostic devices, biomaterials, therapeutics and industrial processes. Research in nanobiotechnology often leads to the development of new tools that may be important "platform technologies" that are useful across many different fields of biotechnology (environmental sciences, agriculture, health care, etc…). Synthetic biology uses information gained through computational biology and informatics (which allows understanding/modeling of biological systems) to design and/or reverse engineer biological devices and systems for useful purposes. Genetic engineering via "molecular tools", such as the CRISPR-Cas9 system allows scientists to redesign cellular systems.

Possible topics for research include, but are not limited to:

- Genome editing (ex: CRISPR-Cas9, TALENS, etc)
- DNA computing
- Synthetic biology
    - Designing biological devices and systems (molecular circuits, diagnostic tools, biosensors)
    - Designing whole viruses, microbes and other organisms
- Nanobiopharmaceutics
    - Drug delivery via nanocarriers (ex: liposomes, nanoparticles)
    - Nanoparticles acting as drugs and therapeutics (ex: biodegradable nanoparticle for immunotherapeutic MS treatment, ex: nanoparticles as antimicrobial agents)
- Biomimetics or "biologically inspired design"
- Current and developing DNA sequencing technologies
    - Nanopore DNA sequencing (single molecule)

  - "next generation" DNA sequencing (short reads – 454 pyrosequencing, SOLiD, Ion Torrent, DNA nanoball, Illumina, etc…)
- "Lab-on-a-chip" systems and sensors
- Molecular and medical imaging systems

**VI. Regenerative Medicine & Biomedical Engineering**

Biomedical engineers, immunologists, physicians and medical researchers from many fields are looking to stem cells and advanced biomaterials for new ways to repair damaged and diseased human tissues and organs. Work in regenerative medicine began many years ago, with the first bone marrow transplants, organ transplants and skin grafts. However, patients receiving donated body tissues have had to deal with immune responses to donated tissues, taking immunosuppressive anti-rejection medications that negatively impact length and quality of life. A revolution in regenerative medicine is now occurring, with new discoveries in stem cell technologies and biomaterials derived from engineered materials and patients own stem cells, preventing immune rejection and repairing the body. For aging populations in developed countries, such as US Baby Boomers, regenerative medicine will play an especially important role in maintaining quality of life and allowing these people to contribute to our society well into their 70's and 80's. Regenerative medicine is also a vital field for treating and rehabilitating military veterans that have sustained severe injuries in the line of duty.

Possible topics for research include, but are not limited to:

- Artificial limbs and biocompatible prostheses
- Stem cell types & potential uses
  - Cord blood stem cells
  - induced pluripotent stem cells
  - embryonic stem cells vs adult stem cells
- Synthetic organs
- Non-immunogenic tissue scaffolds & biomaterials

**** Sponsor teachers and student participants, please email dsjamison@ucdavis.edu to ask for clarification if you are unsure of the most appropriate focus area for a particular website topic. TBC contest administrators reserve the right to re-categorize and group submitted contest websites into the most appropriate focus areas for final judging.****

# Part II: Webpage Design

## General Guidelines for Submissions

**I. Webpage Design Tools**

Students will be allowed to use one of two possible webpage design tools—WiX or Dreamweaver. **WiX** offers no-cost webpage design tools and webpage hosting at www.wix.com. Students will create WiX accounts (login and password) and use the free online tools to build their webpages. **Dreamweaver** software may be used as an alternative to WiX. **Due to administrative constraints, Dreamweaver will be the only web design software supported by the TBC.**

**II. Multimedia Element**

Your webpage must include at least two elements of multimedia. Multimedia may be in the form of graphics, audio clips, Twitter widget, animation, video, or a PowerPoint presentation embedded in the webpage.

**III. Finding & Citing References**

Scientists communicate discoveries to each another, and to the rest of the world, through research articles published in scientific journals. Research articles are "peer-reviewed", meaning that scientific experts in a field of study read and critique articles before publication. Articles that do not meet high standards of excellence are not published. Given this tradition of "quality control", scientific journals are generally the most reputable and reliable sources of scientific information. Most schools and individuals do not have free access to scientific journals. Luckily, the "Open Science" movement has made the results of cutting-edge scientific research publicly available through open access journals.

One of the first open access journals and a great resource for TBC2018 is the Public Library of Science. There are several PLoS journals (PLoSOne, PLoSBiology, PLoSGenetics, etc…) that may be useful in building your TBC webpage. To get started, visit PLoSBiology http://www.plosbiology.org/home.action and PLoS Genetics http://www.plosgenetics.org/home.action to use search terms related to your chosen TBC focus area.

Also, search the free PubMed Central (PMC) article database http://www.ncbi.nlm.nih.gov/pmc/.

Try to use a balanced approach in discussing "pros", "cons" and other opinions. All statements should be supported by citation of reputable references. **Be careful not to present false, "pseudoscientific" information as valid "con" arguments against biotechnology – this will detract from your webpage score during final judging.** Many anti-science groups publish incorrect information online. If you are unsure about the reliability of an information source, please ask your sponsor teacher or librarian.

All sources of information used in building the webpage should be appropriately cited in section V of the webpage content. In accordance with U.S. copyright laws, please reference all materials obtained from the Internet with the original source. Students should take care to phrase gathered information in their own words, as all final entries will be checked for plagiarism. **Webpages with plagiarized content, as determined by the judges, will be disqualified from the contest. If needed, use quotation marks around text taken from other sources and provide an accurate reference citation.**

**IV. Appropriate Content**

Please do not include explicit/offensive language, images or multimedia elements in the webpage content. We also ask that students keep the TBC registration forms, contest materials, and links to online resources similarly "clean". For safety, we request that students do not include any personal images or contact information, such as phone #'s or email addresses, on the webpage. **Webpages with inappropriate content, as determined by the judges, will be disqualified from the contest.**

## Format & Content

Use the following section headings to organize the content of your webpage:

**I. Topic Background**

Provide a general overview of your chosen topic and the corresponding focus area. Questions to consider: When, where, how and why was this application of biotechnology developed? Have traditional technologies been modified or improved through the use of biotechnology? What are the major challenges to research and scientific advancement in this area of biotechnology? Is this application of biotechnology still under development--if so, what do scientists hope to accomplish in the coming years?

**II. Technology Timeline**

Create a timeline that illustrates the development of your chosen biotechnology. For each point along the timeline, include a date (may be written as a year or general timeframe), a brief description of major technical milestones and the names of key scientists and engineers that pioneered the work in this biotech field.

**III. Biotech Innovators & Economic Impact**

Identify at least three currently available biotech products and/or services that have resulted from research and development efforts in your topic/focus area. Discuss the roles that specific members of the biotech community (i.e. research universities, biotech companies, government regulatory agencies, etc...) have played in developing each of these products and/or services. Questions to consider: What types of consumers need or use these biotech products? Is there a large market? A small market? Who funded the research and development required to make the biotech product? What are the benefits of using biotech products, relative to conventional products used for the same purpose. What role (if any) does the average consumer/member of the public play in driving technological innovation?

**IV. Ethical, Legal and Social Issues**

Throughout history, new technologies have often had major impacts on human health and nutrition, daily habits, migration patterns, competition for resources, etc... In some cases, new products and processes are received with suspicion and, in other cases, new ways of "doing" are accepted right away. New technologies are evaluated by society for positive impact, quality and safety, and if they stand up to scrutiny, are usually widely adopted. In biotechnology, we aim to address questions of environmental impact, human safety and intellectual property (ownership of DNA, cells and living materials) before products are released. Biotech research and product development is subject to strict federal regulatory oversight (USDA, EPA, FDA, etc…).

In this section, discuss the impact your biotech topic has had on our society & the world, including related regulatory, ethical or legal issues, and public understanding/perception of biotech. Questions to consider: How does technological innovation in your biotech topic area impact the daily lives of people in the US and in other countries? How do we weigh potential risks against known benefits for new biotech products? Are risks and benefits fairly shared across all members of society? When dealing with biological materials, how do we decide issues of intellectual property and ownership? Which US agencies are involved in regulating this area of biotechnology?
Are current ethical norms, regulatory and legal practices sufficient to address societal concerns in your biotech topic area? Why or why not?

**V. Related Links & Project References**

Include only factual or supported information in your webpage, and clearly indicate which statements are supported by specific references. Use APA or similar reference format to construct a reference list of sources used in your preliminary research. For online references, create a link to the source webpage. Cite sources within the body of the webpage text. **See the General Guidelines for Submissions, Part III, on page 8 of this document for detailed instructions on finding appropriate references.**

## Part III: Application Process

**I. Eligibility**

Currently enrolled California high school students (grades 9-12) are eligible to submit contest entries. Participants should have a reasonable expectation of attendance at the **2018 Teen Biotech Challenge Awards Symposium which will be held on the evening of Monday, May 21th, at UC Davis,** in the event that the entry is chosen as a winner.

**II. Registration Form Deadline**

Sponsor teachers (*for both* class submissions and independently competing students) must register/indicate intent to participate by emailing the completed TBC2018 Registration Form (Excel worksheet) to dsjamison@ucdavis.edu by **Thursday, February 1, 2018. It is crucial that we track the number of students participating in TBC, to support fundraising and grant writing efforts.** The Registration Form (Excel worksheet) is available online at the TBC webpage and will require the following information: 1) the names and high school affiliation of each member of a webpage design group (three maximum); 2) contact information and high school affiliation for a sponsoring science teacher; and 3) a webpage topic description. Modifications to focus area and team composition may be made prior to the deadline for final submission of entries on **Thursday, March 22, 2018**. If there are questions regarding the most appropriate focus area in which to place a particular webpage, please contact us to verify your selection. TBC contest administrators reserve the right to re-categorize and group submitted contest websites into the most appropriate focus areas for final judging.

For teachers conducting the TBC as a class project, consider incorporating the preliminary evaluation of the TBC webpages as a peer group/classroom activity. An evaluation rubric will be posted on the TBC webpage for teachers that would like to opt for this method of final entry selection. Alternatively, teachers may use curriculum-based evaluation metrics to select the six representative entries (one per focus area) from their class. Care should be taken to select final entries that do not contain plagiarized text or pseudo-scientific statements and references, and adhere closely to TBC formatting guidelines.

**IV. Submitting Final Entries**

Final webpage entries must be submitted by sponsor teachers, in order to ensure that a maximum of six entries are submitted (~one per focus area) for evaluation by the TBC judges. **Each sponsor teacher may choose to eliminate one focus areas from their list and submit the maximum of six final entries across five focus areas.** This allows some flexibility in selecting the best class entries for final judging, without overpopulating a particular focus area. There may

be more than one sponsor teacher per school. Students working on the TBC project independently must select a sponsor teacher that will not be submitting a class set of six entries.

**Sponsor Teachers - please complete the TBC2018 Final Entry Form (Excel worksheet found on the TBC webpage), indicating whether the webpage was built with WiX* or Dreamweaver**, and email the form to dsjamison@ucdavis.edu by Thursday, March 22, 2018, at 5pm. Please make sure the students have "published" their webpages online and check them for grammar, spelling and formatting issues! Thanks ☺**

**Important! Once WiX-built TBC final entries have been submitted, students will NOT regain access to their WiX webpages/accounts.** Students intending to modify or use information (text, images, videos, etc…) included on their WiX-built TBC webpages should save that information in local files (ex. on a home computer hard drive, CD, USB flash drive, etc…) before submitting the final webpage entry. Please double-check that final webpage entries follow all contest guidelines and that the WiX webpage entries have been "published" to the web before submitting.
** Flash drives or other storage devices with **Dreamweaver entry files** must be received (hand delivery, mail, FedEx, etc…) by the BioTech SYSTEM office (301 Life Sciences, One Shields Avenue, Davis, CA 95616) **no later than Thursday, March 22, 2018, at 5pm.** Sponsor teachers should coordinate with their students on the best method to deliver the files by the contest deadline—note that our office building closes/locks up at 5pm. Because submitted data storage devices may not be returned, we recommend that students intending to modify or use submitted TBC webpage text or images for future projects save the information in local files (ex. on a home computer hard drive, CD, USB flash drive, etc…).
All students, including those working independently on a TBC webpage entry, are responsible for coordinating with their sponsor teacher on the submission process to meet contest requirements and deadlines.

**V. Final Entry Evaluation & Awards**

Final entries in each focus area will be compared and evaluated by a panel of educators and scientists from UC Davis and the BioTech SYSTEM consortium. **Winning entries will be announced on Monday, May 7, 2018, via email to sponsor teachers. A list of winning entries will also be posted to the TBC webpage.** Cash prizes will be awarded to the first- and second-place winners in each of the six focus areas. Cash prizes amounts will be determined as fundraising efforts proceed. Currently, first place teams share a $100 prize and second place teams share a $60 prize. Third place and Honorable Mention winners will receive certificates and ribbons. SPARK Research Scholars will receive special certificates. Due to space and cost constraints, only First, Second, Third, and Honorable Mention winners and selected SPARK Research Scholar Awardees will be invited to the 2018 Teen Biotech Challenge Awards Symposium.

**VI. TBC2018 Awards Symposium**

The TBC2018 Awards Symposium is slated for the evening of **Monday, May 21, 2018,** at UC Davis. Attendance will be by invitation only. Invitations will include detailed information on the event format, student presentations, driving directions, parking information, etc…and will be sent to winning students and sponsor teachers via email. It is important that sponsor teachers provide valid self and student contact information on the Final Entry Forms in order to receive event info in a timely fashion. If you are a winning sponsor teacher or student and do not receive your invitation, please check your email spam folder and/or contact the UC Davis Biotechnology Program office for event details (530-752-3260).