

Bayer Grants4Tech Robotic Competition

Rules and Prizes

1 Preamble

Bayer is an innovation company with a more than 150-year history and core competencies in the fields of health care and agriculture. We develop new molecules for use in innovative products and solutions to improve the health of humans, animals and plants. Our research and development activities are based on a profound understanding of the biochemical processes in living organisms. Manufacturing of our products requires cutting edge technology and the highest standards of quality. However for certain tasks automation of unstructured activities creates a challenge.

The 2016 Grants4Tech competition aims to strengthen the bond between the Lifescience industry and academic robotic research communities. It shall give insights into the types of unstructured automation challenges we face while advancing new solutions in the area of robotic automation.

The challenge will ask participants to build the robotic hardware and develop the software (a "Robot") that will attempt to master a simplified version of taking samples for quality control from a drum in goods receipt. The Robot will be tasked to open the drum, open the inner bag, tag the sample and finally close the bag and drum. This task is done hundreds of times every day at our multiple sites worldwide. The challenge combines image recognition, movement planning, precise handling of different materials and tools and error recognition in a fixed amount of time. The Robots will be scored by fulfilling a sub step successfully.

In case of a promising and convincing solution, Bayer would like to evaluate whether this could be used to better face the challenges described above.

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2 Eligibility

Individuals may enter as a sole entrant (“Entrant”) or as part of an entrant team (“Entrant Team”). An individual is permitted to be part of more than one Entrant Team and may enter as part of an Entrant Team and as a sole Entrant if they desire. Only one (1) person on an Entrant Team will be considered the Entrant for entry purposes (“Team Representative”). Each member of any Entrant Team must be eligible to participate in this competition as described and comply with the official rules as set out below (“Official Rules”) or such Entrant Team may be disqualified. This Competition is subject to all applicable federal, state and local laws. By participating in the Competition, each Entrant and each member of each participating Entrant Team (as applicable), unconditionally accepts and agrees to comply with and abide by these Official Rules and the decisions of Bayer AG as sponsor of the Competition (“Sponsor”), which will be final and binding including the Sponsor’s right to verify eligibility, to interpret these Official Rules, and to resolve any disputes relating to this Competition at any time.

To be eligible to enter the Competition you must: (1) be above the age of majority in the country, state, province or jurisdiction of residence (and at least twenty years old in Taiwan) at the time of entry; (2) not be a resident of Crimea, Cuba, Iran, Syria, North Korea, or Sudan; (3) not be a person or entity that is listed on any Sanctioned Party List including the "Entity List" or "Denied Persons List" maintained by the U.S. Commerce Department's Bureau of Industry and Security ('BIS') or the "Specially Designated Nationals and Blocked Persons List" maintained by the U.S. Treasury Department's Office of Foreign Asset Controls ('OFAC'); and (4) have access to the Internet as of July 2016. Challenge is void in Crimea, Cuba, Iran, Syria, North Korea, Sudan, and where prohibited by law. Employees, interns, contractors, and official office-holders of Sponsor its subsidiaries, affiliates, and their respective directors, officers, employees, advertising and promotion agencies, representatives, and agents (“Competition Entities”), and members of the Competition Entities and their immediate families (parents, siblings, children, spouses, and life partners of each, regardless of where they live) and members of the households (whether related or not) of such employees, officers and directors are ineligible to participate in this Competition. Sponsor reserves the right to verify eligibility and to adjudicate on any dispute at any time.

If you are entering as part of a company or on behalf of your employer, these Official Rules are binding on you, individually, and/or your employer. If you are acting within the scope of your employment, as an employee, contractor, or agent of another party, you warrant that such party has full knowledge of your actions and has consented thereto, including to the terms of these Official Rules and your potential receipt of a prize. You further warrant that your actions do not violate your employer’s or company’s policies and procedures.

3 Phases of Competition

The timeline of the Competition is planned as described in “Grants4Tech – Robotic Competition Organization”, attached as Annex 1

3.1 Rules “Robot Proposal Entry Period”

Entrant or Entrant Teams who wish to enter the Competition may visit grants4tech.bayer.com (“Competition Site”) and submit the entry information required including, but not limited to: Entrant name, email address, team size, mailing address, daytime phone number, and include an overview of their Robot as defined in Grants4Tech – Robotic Competition, attached as Annex 2 in the form provided (collectively, a “Proposal Entry”).

Proposal Entries may be submitted at any time from July,1 to September 30th (“Robot Proposal Entry Period”). Proposal Entry is not complete until all the online prompts and instructions to upload Proposal Entry have been properly followed and the Official Rules have been affirmatively accepted. Proposal Entries will not be returned and become the property of the Sponsor, Entrants/Entrant Team will retain the rights to any intellectual property pertaining to their idea. If selected to participate in the Finalist Event (as defined below) the Robot itself remains the property of the Entrant. By submitting a Proposal Entry, the Entrant/Entrant Team warrants and represents that Entrant/Entrant Team is the creator of the Proposal Entry and that Entrant/Entrant Team consents to the submission and use of the Proposal Entry in the Competition. Further Entrant/Entrant Team warrants that it has the right to present the Robot and to participate (with the Robot) in the Competition. In addition, Entrant/Entrant Team warrants that here are provided no claims, judgments or settlements against or owed by the Entrant Entrant/Entrant Team or pending or threatened claims or litigation, relating to (the use of) the Robot.

Each Proposal Entry and subsequent Robot must comply with the entry terms, as defined below (“Entry Terms”) and Robot technical requirements set out in Grant4Tech – Robotic Competition – The Competition, attached as Annex 2 in order to be eligible.

It is highly encouraged for Entrants/Entrant Teams to cooperate with partners. Expected partners have to be named in the proposal (“Expected Partners”). Expected Partners are the companies (listed in the Competition Site) which may make available their hardware upon agreement between Entrant and Partner.

ENTRY TERMS: Determination of compliance with entry, technical, and creative requirements and these Official Rules will be in the sole discretion of the Sponsor and the designated Review Panel (as defined below). By entering, each Entrant/Entrant Team warrants that Entry Proposals:

- i. are the original work of the Entrant/Entrant Team or an update to an original work of the Entrant/Entrant Team;
- ii. do not contain any use of names, likenesses, photographs, or other identifying elements in whole or in part, of any person, living or dead, without permission (proof of which must be provided to the Sponsor upon request in a form satisfactory to Sponsor);
- iii. do not infringe or violate the rights of any third party, including but not limited to, copyrights, trademarks, logos, copyrighted material not owned by Entrant/Entrant Team (other than Sponsor’s related materials that were provided to Entrant/Entrant Team by or on behalf of Sponsor in connection with the Competition), contract and licensing rights, rights of publicity or privacy, moral rights, or any other property rights;
- iv. are not subject to any third party agreements other than named in the Entry Proposal, and that Sponsor will not be required to pay or incur any sums to any person or entity as a result of its ownership, acquisition, use or exploitation of the Entry Proposals or rights therein;

- v. were made with the understanding that any required permits from local authorities or other permissions have been obtained and is documented sufficiently such that Entrant/Entrant Team can show proof of such permission upon request from the Sponsor; and
- vi. do not promote any activity that may appear unsafe or dangerous.

3.2 Rules “Robot Proposal Review Period”

All eligible Proposal Entries will be judged and scored by a review panel chosen by the Sponsor (“Review Panel”). The Review Panel will rank Proposal Entries based on the maturity and flexibility of the proposed design and the likelihood the design will result in successful performance in the “Robotic Competition finalist event” (“Finalist Event”). Sponsor reserves the right to assess Proposal Entries in the manner determined by the Sponsor, which may include interviews or discussions with certain Entrants/Entrant Teams.

The six Proposal Entries ranked highest by the Review Panel will be deemed finalists (“Finalist”) (subject to verification and compliance with these Official Rules) and will be invited to attend the Finalist Event.

The Finalist Event is scheduled to take place in Berlin around the CUBE Tech Fair May 2017 during which the Robots compete against other finalist Robots. Sponsor’s decisions are final and binding in all matters relating to this Competition.

3.3 Rules “Finalist Notification Period”

Finalists will be notified by email at the email address provided by middle of October 2016. If any email notification is returned as undeliverable, if a Finalist does not respond within the required number of days specified by Sponsor, or if information collected within the clearance documentation, entry, or background check is found in non-compliance with the Official Rules, raises other issues of significant concern to Sponsor or a potential winner decides to decline the prize for any reason whatsoever, Sponsor shall have no further obligation to such Finalist and the applicable prize will be forfeited and may be awarded to a runner-up Finalist time-permitting and at the Sponsor’s sole discretion.

4 Robot Technical Requirements

Robots that are designed to intentionally damage items (such as piercing or crushing) will be disqualified from the Competition. Questionable designs should be cleared with Sponsor prior to the Entry Proposal. All Robots must include an emergency stop function to halt movement of the Robot. No Robots may include teleoperation or semi-autonomous user input features. Additional requirements are described in the description of the Finalist Event below.

5 Finalist Event and task attempt rules:

An attempt is defined as a single scored run. The attempt starts with the Entrant/Entrant Team to announce the start of a scored attempt. Once the attempt has started no manual or remote interaction with the Robot is allowed. Note that this precludes any teleoperation or semi-autonomous user input to the Robot.

The attempt is finished after either the Entrant/ Entrant Team declares the end, the time limit of 15 minutes is over or a human intervenes remotely or physically. Note that this includes any teleoperation or semi- autonomous user input to the Robot. The score recorded for the attempt is the one when an ending condition is met.

Each Finalists Representative is allowed to have two attempts. The score and time of both attempts will be recorded and the better one used for judging.

Scoring criteria

Each step of the task has a detailed score breakdown. Both attempts will be scored and timed separately and the higher score is used for judging. All Finalists will win a prize. If two or more Finalists have the same final score, then preference will be given to the one that required less time for the scoring attempt.

Scoring:

In the Finalist Event during the two attempts the Finalist will demonstrate to have achieved:

- A mandatory task (“**Mandatory Tasks**”) consisting in opening the clamping ring and the inner bag (Steps 1.b, 1.c, 1.d, 2.a, 2.b 2.c)
- A voluntary sequence of tasks as listed below

- 1) Open one drum out of two different types (including seal and clamping ring)
 - a. 1 point for breaking the seal
 - b. 2 points for opening the clamping ring
 - c. 1 point for securely place the clamping ring aside
 - d. 1 point for securely place the lid aside
- 2) Open inner bag including cutting the cable strap
 - a. 1 point for cutting the cable strap
 - b. 1 point for placing the lid aside
 - c. 1 point for opening the bag
- 3) Take sample and place into sample holder
 - a. 1 point for taking the spoon
 - b. 2 points for taking a sample (20g to 1000g)
 - c. 2 points for place the sample into the sample container
 - d. 1 point to securely place the lid on the sample container
 - e. 1 point for putting the spoon and sample on tray
- 4) Close inner bag (one or two)
 - a. 2 points for grabbing and closing the inner bag
 - b. 2 points for attaching a new cable strap to inner bag
 - c. 1 point for pushing down the closed inner bag
- 5) Close drum (and attach new seal)
 - a. 1 point for taking lid
 - b. 1 point for putting the lid on the drum
 - c. 2 points for replacing the clamping ring on the drum
 - d. 2 points for applying a new seal

6 Scoring Penalties

For certain actions and undesired outcomes penalties will be assigned and subtracted from the score:

- Damage to the drum (minor scratching is allowed. But severe bending, piercing the metal or carton is not)
- Damage to the bag
- Loss of powder from the sample before it is on the tray
- Separation of bag and drum i.e. taking the bag out of the drum

7 PRIVACY

Proposal Entries include information relating to identified or identifiable natural persons (“**Personal Data**”), in particular name, title, email address, mailing address, phone number and age of Entrants as well as names of members of Entrant Teams. By submitting Personal Data of members of Entrant Teams in the Proposal Entry, Entrant represents and warrants that he/she has obtained all necessary permissions from all members of the Entrant Team to submit their Personal Data to Sponsor. Sponsor collects, processes and/or uses Personal Data submitted in Proposal Entries for the purposes of the Competition in accordance with these Entry Terms, in particular for verifying the identity of Entrants and members of Entrant Teams, for administering the Competition and to contact the Entrant for the organization and execution of the Competition.

Consents granted by Entrant for the collection, processing and use of data can be withdrawn by Entrant at any time with effect for the future.”

8 Prizes

The top three Finalists will receive monetary prizes as listed below:

1st place: 40.000€

2nd place: 20.000€

3rd place: 15.000€

All monetary prizes for the best three solutions are conditional on Finalists completing the Mandatory Tasks as outlined before.

The remaining Finalists attending the Final Event will be rewarded with 10.000€.

If there are Finalists equal in score and time they will receive split prizes for their position.

Prizes are non-transferable. No prize substitutions or cash redemptions allowed. Except where prohibited by law, all federal, state, or other tax liabilities are the responsibility of the prize winners and the Sponsor will not be responsible for any tax deductions which may be necessary. In the event an Entrant Team is deemed a prize winner, the Entrant Team Representative of such Entrant Team will be solely responsible for dividing the applicable equally amongst all team members. Prize winners are responsible for any costs and expenses associated with prize acceptance and use not specified herein as being provided. Designation as a prize winner is subject to Entrant’s/Entrant’s Team proof of compliance with the Official Rules, maintaining compliance with these Official Rules and approval by the Sponsor. All details of prize not specified herein shall be determined solely by Sponsor.

9 INDEMNIFICATION AND ACKNOWLEDGMENT

The Sponsor reserves the right, in his sole discretion, to disqualify any Entrant/Entrant Team found tampering with the entry process or entry materials or otherwise interfering with the proper administration of the Competition or violating the Official Rules.

EACH ENTRANT/ENTRANT TEAM MEMBER ACCEPTS THE CONDITIONS STATED IN THE OFFICIAL RULES, AGREES TO BE BOUND BY THE DECISIONS OF THE SPONSOR, WARRANTS THAT HE OR SHE IS ELIGIBLE TO PARTICIPATE IN THIS COMPETITION, AND AGREES TO RELEASE, INDEMNIFY, AND HOLD HARMLESS SPONSOR AND EACH OF THEIR PARENT COMPANIES, DIVISIONS, SUBSIDIARIES, AFFILIATES, ADVERTISING, PROMOTION, AND PUBLIC RELATIONS AGENCIES, AND THE RESPECTIVE OFFICERS, DIRECTORS, EMPLOYEES, REPRESENTATIVES, AND AGENCIES OF EACH FROM AND AGAINST ANY AND ALL CLAIMS, LOSSES, LIABILITY, AND DAMAGES OF ANY KIND, (INCLUDING REASONABLE ATTORNEYS' FEES AND EXPENSES) ASSERTED AGAINST ANY OF THEM, INCURRED, SUSTAINED, OR ARISING IN CONNECTION WITH THE USE, ACCEPTANCE, OR MISUSE OF THE PRIZE OR WHILE PREPARING FOR, PARTICIPATING IN, AND/OR TRAVELING TO OR FROM ANY COMPETITION-RELATED ACTIVITY, INCLUDING, WITHOUT LIMITATION, ANY INJURY, DAMAGE, DEATH, LOSS, OR ACCIDENT TO PERSON, ANIMAL OR PROPERTY, OR FROM THE RESPECTIVE ENTRANTS' /ENTRANT TEAMS BREACH OF ANY AGREEMENT OR WARRANTY ASSOCIATED WITH THE CHALLENGE, INCLUDING THE OFFICIAL RULES. ANY ATTEMPT TO DELIBERATELY DAMAGE ANY WEBSITE OR UNDERMINE THE LEGITIMATE OPERATION OF THE CHALLENGE IS A VIOLATION OF CRIMINAL AND CIVIL LAWS AND, SHOULD SUCH AN ATTEMPT BE MADE, THE SPONSOR AND EACH OF THEIR LICENSEES RESERVE THE RIGHT TO SEEK ANY AND ALL REMEDIES AVAILABLE FROM ANY SUCH PERSON(S) RESPONSIBLE FOR ANY SUCH ATTEMPT TO THE FULLEST EXTENT PERMITTED BY LAW.

Each Entrant/Entrant Team member acknowledges and agrees that the relationship between themselves and the Sponsor is not a confidential, fiduciary, or other special relationship, and that the Entrant's/Entrant Team's decision to provide the Entry Proposal to Sponsor for purposes of the Competition does not place the Competition Entities in a position that is any different from the position held by members of the general public with regard to elements of the Entry Proposal, other than as set forth in the Official Rules. Each Entrant/Entrant Team also acknowledges that many ideas or stories may be competitive with, similar to, or identical to the Entry Proposal and/or each other in theme, idea, format, or other respects. Each Entrant/Entrant Team acknowledges and agrees that such Entrant/Entrant Team will not be entitled to any compensation as a result of Competition Entities' use of any such similar or identical material that has or may come to Competition Entities, or any of them, from other sources. Entrants/Entrant Teams acknowledge that other Entrants/Entrant Teams may have created ideas and concepts contained in their Entry Proposal that may have familiarities or similarities to their Entry Proposal, and that they will not be entitled to any compensation or right to negotiate with the Sponsor because of these familiarities or similarities.

10 Responsibilities

Entrants/Entrant Teams further agree that the Sponsor and any of their respective parents, subsidiaries, affiliates, and each of their respective officers, directors, shareholders, agents and employees, and any Internet access providers are not responsible for the following: (a) electronic

transmissions, Robots or Entry Proposal that are lost, late, stolen, incomplete, damaged, garbled, destroyed, misdirected or not received by Sponsor for any reason; (b) any problems or technical malfunctions, errors, omissions, interruptions, deletions, defects, delays in operation or transmission, communication failures and/or human error that may occur in the transmission, shipping errors or delays, receipt or processing of entries or related materials; or for destruction of or unauthorized access to, or alteration of, entries or related material; (c) failed or unavailable hardware, network, software or telephone transmissions, damage to Entrants'/Entrant Team R or any person's computer and/or its contents related to or resulting from participation in this Competition, or (d) causes that jeopardize the administration, security, fairness, integrity, or proper conduct of this Competition; (e) any Entry Proposal submitted in a manner that is not expressly allowed under these Official Rules (all such Entry Proposal will be disqualified); (f) any printing errors in the Official Rules or in any advertisements or correspondence in connection with this Competition. Sponsor reserve the right, in its sole discretion, to cancel or suspend this Competition should virus, bugs, fraud, hacking, or other causes corrupt the administration, security, or proper play of the Competition. In such cases, notice to this effect will be posted on the Competition Site. If, in Sponsor's opinion, there is any suspected or actual evidence of electronic or non-electronic tampering with any portion of the Competition or if technical difficulties compromise the integrity of the Competition, the Sponsor reserves the right to void suspect Entry Proposals and/or terminate the Competition and award the prizes in its sole discretion. In the event of a dispute as to the identity of an Entrant/Entrant Team based on an email address, the Entry Proposal in question may be disqualified subject to the Sponsor's discretion.

11 DISPUTES

You agree that: (1) any and all disputes, claims and causes of action arising out of or connected with this Competition or any prize awarded shall be resolved individually, without resort to any form of class action; (2) any and all claims, judgments and awards shall be limited to actual out-of-pocket costs incurred, including costs associated with entering this Competition, but in no event attorneys' fees; and (3) under no circumstances will you be permitted to obtain awards for, and you hereby waive all rights to claim, indirect, punitive, incidental and consequential damages and any other damages, other than for actual out-of-pocket expenses, and any and all rights to have damages multiplied or otherwise increased. All issues and questions concerning the construction, validity, interpretation and enforceability of the Official Rules, or the rights and obligations of the Entrant/Entrant Team and Sponsor in connection with the Competition, shall be governed by, and construed in accordance with, the laws of Germany without giving effect to any choice of law or conflict of law rules, which would cause the application of the laws of any jurisdiction other than Germany .

12 SPONSOR

Bayer AG, Leverkusen, Germany

Grants4Tech – Robotic Competition Annex 1

Organization

A1.1 Competition Timeline

COMPETITION CALENDAR: The Competition starts on July, 1st 2016 and ends on May, 12th 2017. Sponsor’s computer is the official timekeeper for this Competition. The Competition phases are noted in the calendar below. The dates are approximate and are subject to change at Sponsor’s discretion.

PHASES	STARTS	ENDS
	AT 12:00 AM ON:	AT 11:59 PM ON:
PHASE 1: Robot Proposal Entry Period	July 1st, 2016	September 30th, 2016
PHASE 2: Robot Proposal Review Period	September 30th, 2016	Mid-October 2016
PHASE 3: Development Phase	Mid-October 2016	April 30th, 2017
PHASE 4: Finalist Event	May 2017	May 2017
PRIZE WINNERS ANNOUNCE		
	At Finalist Event	

A1.2 The Finalist Event

The Finalist Event will take place in Berlin. Travel and transport costs for each team will be covered by the Sponsor (economy class flights, three stars hotel, transport of the robot to the event location) for a maximum of 5 team members.

The Finalist Event will require each robot to manage the 6 steps that are part of the sample taking task (mandatory tasks):

1. Open one drums out of two different types (including clamping ring)
2. Securely place the clamping ring aside
3. Securely place the lid aside
4. Cut the cable strap
5. Put the cable strap aside
6. Open the bag

The Finalist Event will take place over 2 days and each team will have a dedicated place for the duration of the Finalist Event. The first day will be used for setup and testing.

On the second day each team will give a short interactive demonstration of their Robot and the approach they took. The teams will not be scored on the presentation; this is for information purposes only. Afterwards each team will compete in the sample taking task.

Grants4Tech – Robotic Competition Annex 2

The Competition

A2.1 Workflow to be solved

The required workflow is shown in the video available at our web-site at:

grants4tech.bayer.com

1. Open one drum out of two different types (including seal and clamping ring)
 - 1a. breaking the seal
 - 1b. opening the clamping ring
 - 1c. securely place the clamping ring aside
 - 1d. securely place the lid aside
2. Open inner bag including cutting the cable strap
 - 2a. cutting the cable strap
 - 2b. putting it aside
 - 2c. opening the bag
3. Take sample and place into sample holder
 - 3a. taking the spoon
 - 3b. taking a sample (20 to 100 grams)
 - 3c. place the sample into the sample container
 - 3d. securely place lid on sample container
 - 3e. putting the spoon and sample on tray
4. Close inner bag (one or two)
 - 4a. grapping and closing inner the bag
 - 4b. attaching a new cable strap to inner bag
 - 4c. pushing down the closed inner bag
5. Close drum (and attach new seal)
 - 5a. taking lid
 - 5b. putting the lid on the drum
 - 5c. replacing the clamping ring on the drum
 - 5d. applying a new seal

Mandatory steps are 1b.,1c.,1d.,2a.,2b.,2c.

A2.2 Material to be handled

The drums:

The drums are provided by Sponsor to the teams after selection of the Finalist in phase 2, together with seals and clamping rings and inner bags. For the Final Event a new set of drums will be provided (of the same types as sent out to the teams) to ensure equal terms for each Finalist. Additional added markers on the drums are object to discussion.

The bag:

The bags are also provided by Sponsor to the Finalist. They are sealed with a standard cable strap. For the Final Event a new bag will be provided (of the same type as sent out to the teams) to ensure equal terms for each Finalist. Additional added markers on the bags are object to discussion.

The filling:

All bags will be filled with the same substance (white powder) provided by Sponsor

Sample container

The sample container and the sampling tool are left to the choice of the Finalist. The requirement is to sample a quantity between 20 to 100 gr.

A2.3 Workstation layout

The workstation where the Robot needs to be setup is not restricted. The overall space allowed should not exceed 3.5 m * 3.5 m. If the Finalist need additional tables, racks etc. , they must also be placed inside the marked area. The Finalists are allowed to fixate the drums with additional means if necessary.