Tapping into the InnoCentive global solver community to obtain innovative solutions for R&D

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Overview

• InnoCentive is an online forum that allows science based companies access to a global community of scientists to provide solutions to specific R&D challenges

• Formed in 2001 as an e-business venture of Eli Lilly

• Based in Andover, Massachusetts
The Current R&D Environment

- Increased pressure for faster, more cost effective R&D
- Innovation-driven companies bear monolithic financial risk
- *No one company* has >1% of global R&D capacity internally
- Likely that source of many innovative solutions is *outside* corporation

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Agenda

- InnoCentive Overview
- Scientific Operations Process
- Challenge Examples
- Results Summary
How does InnoCentive work?

Seeker Companies → InnoCentive Scientific Operations → Solver Scientists
Broad Distribution of Registered Solvers

> 60,000 Solvers
- Contract Labs
- Retirees
- Students
- Faculty
- Small Pharma
- Biotech
- Institutes
- Industry

= Countries With Registered Solvers
Who are the Seekers?

Over Two Dozen, Including:

- Air Products
- Novozymes
- Dow
- Du Pont
- Dow AgroSciences
- BASF
- Henkel
- P&G
- Syngenta
- Nestlé Purina
- UOP
- Boeing
- Lilly
- Degussa
- Rhodia
# The Scientific Operations Process

<table>
<thead>
<tr>
<th>Developing Challenges</th>
<th>Tapping Global Talent</th>
<th>Evaluating Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Outcome:</strong> Challenge posted</td>
<td><strong>Outcome:</strong> Submissions received</td>
<td><strong>Outcome:</strong> Award given</td>
</tr>
</tbody>
</table>

**Scientific Operations** helps you **identify** appropriate Challenges.

**Scientific Operations** helps you **formulate** your Challenges.

**Scientific Operations proactively matches** the right Solver scientists with your Challenges.

**Scientific Operations actively works** with Solvers to be sure their submissions **address your criteria**.

**Scientific Operations forwards** appropriate solutions for your review.

**Scientific Operations facilitates** award payment and Intellectual Property transfer.

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The anatomy of a Challenge

INNOCENTIVE

INNOCENTIVE 1186758
Novel "Green" additives
POSTED: OCT 03, 2003
DEADLINE: APR 30, 2004
$50,000 USD

Identification of a novel additive with "green" properties needed. More details are available on the InnoCentive Solver.

INNOCENTIVE 995390
TMBA (3,4,5-tri-methoxy benzoic acid)
POSTED: JUL 01, 2003
DEADLINE: MAR 31, 2004
$5,000 USD

A proposal for a cost-efficient synthesis of 3,4,5-tri-methoxy benzoic acid (TMBA) is needed. More details are available once you register as an InnoCentive Solver.

INNOCENTIVE 991141
Synthesize hexamethylene-1,6-diisocyanate
POSTED: JUN 27, 2003
DEADLINE: MAR 30, 2004
$10,000 USD

Can you find a suitable catalyst system to catalyze a reaction that produces hexamethylene-1,6-diisocyanate? More details are available once you registered as an InnoCentive Solver.

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Information Access

1. Abstract
   - Global scientific community
   - Publicly available information
   - Objective: attract interest

2. Summary
   - Registered Solvers only
   - Non-confidential information
   - Solver self-selection

3. Confidentiality Agreement
   - Binding confidentiality for Seekers and Solvers
   - License to evaluate (transfer to full license on award)
   - Standard contract terms

4. Details
   - Full confidential details
   - Anonymity preserved
   - Project Room: secure, private communications

Thousands of scientists view Challenge
Fewer scientists interested in Challenge
Final few scientists qualified to solve Challenge
Challenge Disciplines

**CHEMISTRY & APPLIED SCIENCES**
- Analytical Chemistry
- Catalysis
- Colloid Chemistry
- Formulation Chemistry
- Materials Science
- Nanotechnology
- Organic Chemistry
- Physical Chemistry
- Polymer Chemistry
- Synthetic Chemistry
- Process Chemistry

**LIFE SCIENCES**
- Biochemistry
- Biomarkers
- Enzymology
- Food Science
- Pharmacology
- Physiology
- Plant Biology

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## Challenge Types

<table>
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<tr>
<th>Theoretical Challenge</th>
<th>Reduction to Practice Challenge</th>
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<tbody>
<tr>
<td>looking for a research proposal</td>
<td>looking for a validated solution</td>
</tr>
<tr>
<td>No lab work required</td>
<td>Requires lab work</td>
</tr>
<tr>
<td>Seeker does not validate in their lab prior to acceptance</td>
<td>Seeker can validate in their lab prior to acceptance</td>
</tr>
<tr>
<td>Seeker has limited period to evaluate solutions</td>
<td>Seeker has longer time period to evaluate solutions</td>
</tr>
<tr>
<td>Award levels: $10-25K</td>
<td>Award levels: $25K and above</td>
</tr>
</tbody>
</table>
Awarded Challenge
InnoCentive 3109
R4-(4-hydroxyphenyl) Butanoic Acid

○ Challenge Abstract
An efficient synthetic strategy for the following butanoic acid derivative is required. Devise and execute the “best synthetic pathway.”

○ Solution Criteria
  • 2 steps or less
  • >80% overall yield
  • <$100/Kg
  • >95% purity
  • 2.0g white-off white solid

○ Results
221 Project Rooms
7 Submissions
1 Award

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Awarded Challenge
InnoCentive 96229
Regio- and Stereocontrolled Tricyclic Alcohols

- Challenge Abstract
  Novel, convergent synthetic route for all six regio and stereoisomers.

- Results
  105 Project Rooms
  11 Submissions
  2 Awards
Awarded Challenge
InnoCentive 216128
Protein Crosslinks

- **Challenge Abstract**
  Can you develop a novel paper proposal of a molecule to spontaneously break protein crosslinks? There are approaches described in the literature, however, a novel alternative approach is needed.

- **Results**
  135 Project Rooms
  4 Submissions
  1 Award
AWARDED!
InnoCentive 1480505
Synthesis of 2,2'-diamino-4,4'-biphenyldicarboxylic acid
Posted: DEC 03, 2003
Deadline: MAR 04, 2004

- Structure
- Challenge Abstract
  A cost-effective synthesis of the title compound is required. More details are available once you registered as an InnoCentive solver.

- Result:
  - 419 project rooms
  - 53 submissions
  - 2 Award
AWARDED!
InnoCentive 1470313
Lowering of CO levels
Posted: DEC 01, 2003
Deadline: MAR 15, 2004

○ Challenge Abstract
Identification of a media to lower CO level is required. More details are available once you registered as an InnoCentive Solver.

○ Result:
115 Project rooms
20 Submissions
1+ Award
R&D Support through InnoCentive

- **Process Chemistry**
  - Alternate and optimized syntheses
  - General methodology
  - Supply of material

- **Discovery Chemistry**
  - Novel synthetic routes
  - Efficient synthesis of key intermediates
  - Supply of material
  - Small compound libraries

- **Biology**
  - Target elucidation
  - Sourcing of Isolated Protein
  - Assay development
Solution Rate Varies Among Different Seeker Clients

- 100%
- 77%
- 50%
- 48%
- 33%
- 27%
- 17%
- 0%
- 0%

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## Writing Challenges for Success

<table>
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<tr>
<th>Low Probability of Success</th>
<th>High Probability of Success</th>
</tr>
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<tbody>
<tr>
<td>Challenges looking for complete program solutions</td>
<td>Discrete scientific Challenges (synthesis of a molecule, development of an assay, etc.)</td>
</tr>
<tr>
<td>“Unsolvable” Challenges</td>
<td>Search for a novel idea or expert opinion</td>
</tr>
<tr>
<td>Drastically underpriced Challenges or Challenges with insufficient deadlines</td>
<td>Extension of internal capacity</td>
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Results Since Launch: Awards

- Over 200 challenges (~3.5 million USD)
- >65,000 solvers (> 125 countries)
- 50+ awards to date (many under review/pending)
- Global source of solutions
  - Canada - Japan - Singapore
  - China - Kazakhstan - Spain
  - Denmark - N.Ireland - Sweden
  - Egypt - Philippines - Thailand
  - Germany - Poland - UK
  - India - Romania - USA
  - Israel - Russia
Key Learnings 2002-2004

- Business model works
- Global reach
- Success rate related to award level and nature of scientific problem
- Experimentation provides evolution
The Value Proposition

Seekers

- Challenge formulation
- Intellectual property mgmt
- Access to a global pool of scientific talent
- Shifting of risk associated with R&D

Solvers

- Access world-class intellectual challenges
- Build relationships with leading research organizations
- Find industry application for scientific research
- Recognition & Financial reward

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Questions?