

Figure 1: A snapshot of designing a DNA sequence in a browser-based programming environment provided by RIKEN SciNeS

GenoCon My Page > [GenoCon Entry form](#) > JavaScriptSample [Exit edit mode](#) Taro Riken | [JAPANESE](#)

Exit Script Include History

JavaScript Editor

Save Execute in new window Display Logger [API Document](#)

```

1 var map = {};
2
3 function reverseTranslation(ps) {
4   var ns = "";
5   for (var i=0; i<ps.length;i++) {
6     ns += map[ps.charAt(i)];
7   }
8   return ns;
9 }
10
11 function main() {
12   // 1. To obtain HPS protein sequence
13   var hpsSeq = SciNeS.DB.get("/sw/protein/cris138s15ria138s1i");
14   SciNeS.write("HPS Protein Sequence: " + hpsSeq + "<br/>");
15
16   // 2. Reverse-translate the obtained HPS protein sequence to DNA
17   // sequence
18   var hpsDnaSeq = reverseTranslation(hpsSeq);
19   SciNeS.write("HPS DNA Sequence: " + hpsDnaSeq + "<br/>");
20
21   // 3. Obtain PHI protein sequence
22   var phiSeq = SciNeS.DB.get("/sw/protein/cris138s15ria138s2i");
23   SciNeS.write("PHI Protein Sequence: " + phiSeq + "<br/>");
24
25   // 4. Reverse-translate the obtained PHI protein sequence to DNA
26   // sequence
27   var phiDnaSeq = reverseTranslation(phiSeq);
28   SciNeS.write("PHI DNA Sequence: " + phiDnaSeq + "<br/>");
29   SciNeS.write("<br/>");
30
31   // 5. Combine those two DNA sequences
32   var dnaSeq = hpsDnaSeq + phiDnaSeq;
33   SciNeS.write("Designed Sequence: <font color='red'>" + dnaSeq +
34   "</font><br/>");
35
36   // 6. Register the combined DNA sequences in RIKEN SciNeS
37   SciNeS.DB.put("/sw/dna",dnaSeq);
38 }
39
40 map.W = "atg";
41 map.F = "ttt";
42 map.L = "tta";
43 map.I = "att";
44

```

Save

[My Page](#) / [Check Uploaded Files](#) / [Inquiries](#)

Tutorials of JavaScript@SciNeS

- [What is JavaScript@SciNeS ?](#)
- [Use a Sample Program](#)

JavaScript@SciNeS is a library which enables users to use registered data on RIKEN SciNeS by JavaScript. Only programs executable by JavaScript editor on the left side of this screen can be qualified to enter GenoCon.

Copy sample codes shown below and paste them in the window on the left side.

```

var map = {};

function reverseTranslation(ps) {
  var ns = "";
  for (var i=0; i<ps.length;i++) {
    ns += map[ps.charAt(i)];
  }
  return ns;
}

function main() {

```

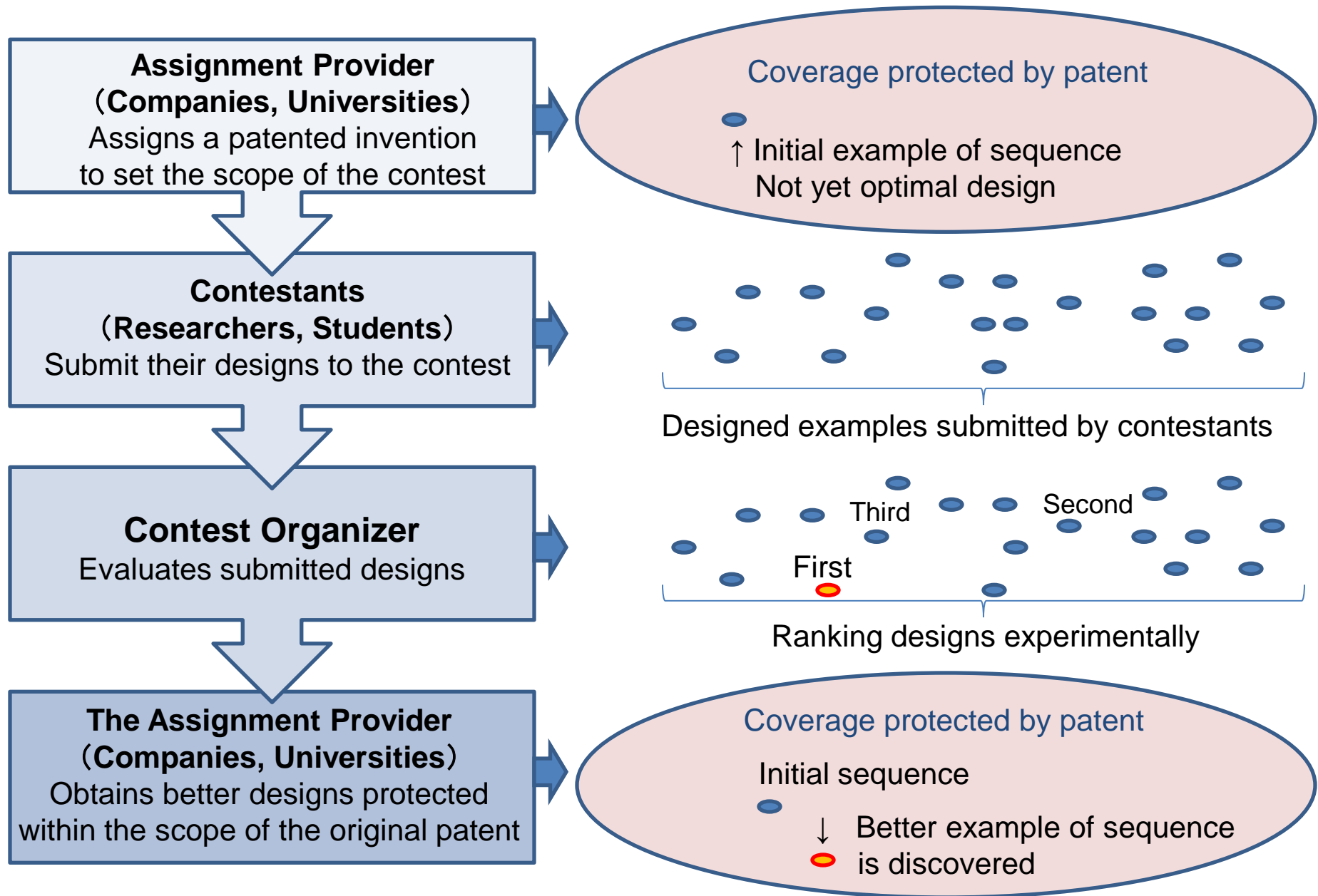
Result

HPS Protein Sequence:
 MEQLQALDLVNFPEAIELVKEVEQYIDVVEJGTPVINEGLRAVKEIKEAFPOKVLADLKIMDAGGYEIMKASEAGADIEVLGATDDATIKGAVEEAKKOKKKLVDMINVKDIESRAKEI
 HPS DNA Sequence:
 atgaaftacaattagcttttagatttagttaaatahcttgaagctattgaattagtttaaagaagttgaacaataattgatgttttgaattggtactctctgttttattaagaagtttaactgtctgttaaagaattaaagaagcttttctcaatta

PHI Protein Sequence:
 MKTTEYVAEILNELHNSAAYNEEADQLADHILSSHQIFTAGAGRSGLMAKFSAMRLMHMGFNAHVGEILTPFLAEGDLVDSGSGGETKSLIHTAAKAKSLHGIVAALTNPESSVG
 PHI DNA Sequence:
 atgaaactactgaatagtttcttgaattttaaagaattacataatgactctctctctattatagtaagaaagactgacactgactgacatattttaagtagctatcaaaattttactctctgtctctgtctagttttaaagctcaaaagttt

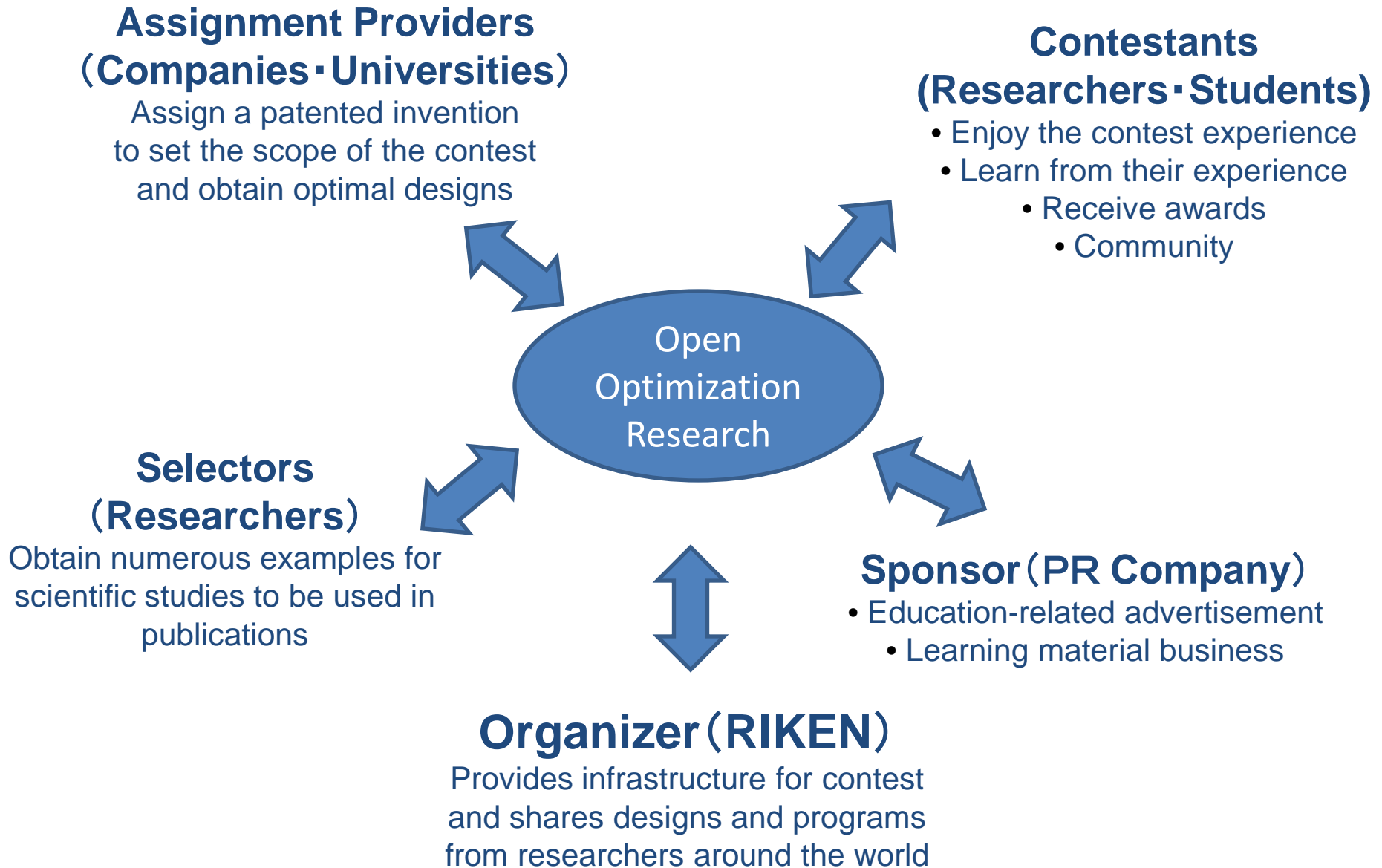
Designed Sequence:
atgaaftacaattagcttttagatttagttaaatahcttgaagctattgaattagtttaaagaagttgaacaataattgatgttttgaattggtactctctgttttattaagaagtttaactgtctgttaaagaattaaagaagcttttctcaatta

Figure 2: Flow of Open Optimization Research Processes



Contestants enjoy the contest and assignment providers obtain better examples of sequences.

Figure 3: Incentives for participants in “Open Optimization Research”



International Rational-Genome-Design Contest with Arabidopsis

GENOCON *for Synthetic Biology*

Web-based contest aimed at supporting a future generation of scientists – including a category for high-school students.

A challenge for green innovation: rational genome design of a plant with an environmental detoxification function.

Accumulation and sharing of genome-design theories and programs from researchers around the world.



GenoCon contestants design DNA sequences in a web-browser-based programming environment. RIKEN evaluates their functions experimentally.

<http://genocon.org>

Organizer: RIKEN BASE (Bioinformatics And Systems Engineering division) / Co-organizer: RIKEN GSC (Genomic Sciences Research Complex)