

This record is presented in recognition of contributions to Eterna, the internet-scale molecular design platform.  
Verify authenticity of this record at: <https://eternagame.org/certificate/20>

ISSUED March 13, 2025

## PLAYER DETAILS

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PERSONAL NAME	rhiju
PLAYER NAME	rhiju
REGISTRATION DATE	January 2010
GLOBAL RANK	1,089 of 309,278
PUZZLES CLEARED	296
PUZZLES CREATED	2
TUTORIALS CLEARED	4/5
ADVANCED TUTORIALS CLEARED	9/10

Eterna puzzles are created by the Eterna team or players. They invite players to devise effective procedures for pairing nucleotides in hypothetical or biologically-inspired RNA strands.

Learn more on rhiju's player profile: <https://eternagame.org/players/20>

## PUBLICATION CONTRIBUTIONS

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*Contributions towards pre-print or peer-reviewed scientific publications.*

### 1. RNA DESIGN RULES FROM A MASSIVE OPEN LABORATORY

February 2014 Proceedings of the National Academy of Sciences *Author*

### 2. PRINCIPLES FOR PREDICTING RNA SECONDARY STRUCTURE DESIGN DIFFICULTY

February 2016 Journal of Molecular Biology *Author*

### 3. ETERNABRAIN: AUTOMATED RNA DESIGN THROUGH MOVE SETS FROM AN INTERNET-SCALE RNA VIDEOGAME

June 2019 PLOS Computational Biology *Author*

### 4. RNA SECONDARY STRUCTURE PACKAGES EVALUATED AND IMPROVED BY HIGH-THROUGHPUT EXPERIMENTS

October 2022 Nature Methods *Author*

### 5. SENTRNA: IMPROVING COMPUTATIONAL RNA DESIGN BY INCORPORATING A PRIOR OF HUMAN DESIGN STRATEGIES

March 2018 Preprint *Author*

### 6. THEORETICAL BASIS FOR STABILIZING MESSENGER RNA THROUGH SECONDARY STRUCTURE DESIGN

September 2021 Nucleic Acids Research *Author*

### 7. CROWDSOURCED RNA DESIGN DISCOVERS DIVERSE, REVERSIBLE, EFFICIENT, SELF-CONTAINED MOLECULAR SENSORS

April 2022 *Proceedings of the National Academy of Sciences* *Author*

**8. PROSPECTS FOR RECURRENT NEURAL NETWORK MODELS TO LEARN RNA BIOPHYSICS FROM HIGH-THROUGHPUT DATA**

December 2017 *Preprint* *Author*

**9. COMBINATORIAL OPTIMIZATION OF MRNA STRUCTURE, STABILITY, AND TRANSLATION FOR RNA-BASED THERAPEUTICS**

March 2022 *Nature Communications* *Author*

**10. REDESIGNING THE ETERNA100 FOR THE VIENNA 2 FOLDING ENGINE**

August 2021 *Preprint* *Author*

**11. DEEP LEARNING MODELS FOR PREDICTING RNA DEGRADATION VIA DUAL CROWDSOURCING**

December 2022 *Nature Machine Intelligence* *Author*

**12. COMMUNITY SCIENCE DESIGNED RIBOSOMES WITH BENEFICIAL PHENOTYPES**

February 2023 *Nature Communications* *Gameplay Contributor, Author*

**13. MINIMIZATION OF THE E. COLI RIBOSOME, AIDED AND OPTIMIZED BY COMMUNITY SCIENCE**

January 2024 *Nucleic Acids Research* *Author*

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**DESIGN SUBMISSIONS**

*Contributions towards Eterna biomedical challenges experimentally tested through in-vitro synthesis and structure*

*mapping measurements.*

		TESTED	BEST (%)
The Finger	2	0	0
Bulgeless Cross	1	0	0
One Bulge Cross	1	0	-
Classic Eterna	1	1	83
First Player Project	1	1	79
Cloud Lab 20 - Random 4 by mat747	1	0	67
Testing 3D structure prediction of G/G mismatches (boosts!)	16	0	92
Testing for crazy conformations of tandem G/A and A/G pairs	18	0	86
A codon riboswitch	47	0	94
Codon riboswitch [repeat of tryptophan]	47	0	0
Codon riboswitch [arginine]	59	0	0
Codon riboswitch [histidine]	63	0	0
Eterna History Tour - Introduction to Lab	2	1	87
miRNA Switch Lab round 2 for Rhiju's class	1	1	65
MS2 Cooperative Binding	5	5	74
MS2 Cooperative Binding - Round 3	5	5	74
OpenCRISPR - Controls	21	0	-
OpenRibosome Pilot Challenge	1	0	50
Testing Lab mgotrik	5	0	-
OpenRibosome Pilot Challenge Warm-up	1	0	-
OpenVaccine: [Round 6] Focus on Nanoluciferase mRNA	4	0	94
OpenVaccine B.1.617 with Pseudouridine	1	0	-
Pseudoknot Challenge: Pilot round	1	1	48
OpenKnot Round 1	92	43	47
Pseudoknot Detective	1	1	45

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**TOTAL (#):** The total number of design submissions made to an Eterna challenge.

**TESTED:** The total number of design submissions made to an Eterna challenge that were experimentally tested.

**BEST (%):** Player's best score (as a percentage) for experimentally tested design submissions made to an Eterna challenge

