# Vivek Rai

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## Education

Indian Institute of Technology Kharagpur, India
B.Tech & M.Tech, *Biotechnology*
GPA: **8.65** (out of 10), Class rank: **1** 2012-2017

## Publications

**Biorxiv (in submission)** Priyam, Woodcraft, **Rai** *et al.*, "Sequenceserver: rapid creation of assistive graphical BLAST frontends for custom sequence databases" `http://sequenceserver.com`

## Research Experience

**B.Tech thesis**
**IIT Kharagpur**
Aug 2015–present

Bioinformatic analysis of protein knots and their knotting mechanism.

- Investigating the role of structural (e.g. sequences, secondary structures) and functional patterns in knotted proteins and how they may influence the knotting mechanism.(Talk)

**Research Intern**
**MRDG, IISc**
May 2015–Jul 2015

Fluorescent labeling and lipid phase dependence study of *E.coli* ClyA toxin.(Report)

- Extracted, purified and labeled (fluorescence) the wild type and mutant proteins obtained from expression vectors.
- Assessed toxin activity and qualitatively demonstrated a lipid phase dependent kinetic behavior of Cytolysin A; one of the foremost such study of the toxin.

## Development Experience[1]

**WIGI, Wikimedia**
May 2015–present

A Wikimedia project to quantify gender biases in Wikipedia and create quantitative indicators.

- Analyzed raw Wikidata information to visualize gender information across categories, performed statistical analysis, and developed the website for showcasing results.
- Assisted in research and community efforts by writing research paper, blog posts, and reviewing reports.

**Sequenceserver**
Jun 2014–present

- Implemented `BLAST+` output parser module, backend data-module in **Ruby**, and designed graphical overview scheme for BLAST hit information using **D3.js**.
- Contributed more than **110 commits** over an year and co-authored the research paper.

**Afra**
Dec 2014–Jan 2014

- Improved user interface of the gene annotation platform for better visual feedback
- Handled annotation data, introduced multiple sessions sync, and streamlined annotation editing features in backend.

[1] Exhaustive list at GitHub and an online version of resume.

## Skills

**Areas** Bioinformatics, Systems biology, Computational modeling, Data visualization

**Languages** Python (+scipy), Ruby, SQL, JavaScript, R, MATLAB, BASH, C

**Tools** GNU/Linux (*nix), Vim, Git, LaTeX

## Conferences and Seminars

**Winter School**
Dec 2015

Attended **Winter School on Quantitative Systems Biology 2015** organized at International Centre for Theoretical Science, Bangalore in association with ICTP, Italy.

**Short Term Course**
Mar 2014

Attended a set of seminars on next-gen sequencing, interaction networks and computational tools as a part of **Short Term Course on Computational Biology** organized at Indian Institute of Technology Kharagpur.

## Coursework

**Term Paper**
Feb 2014–Feb 2014

Comparison of Fuzzy Guided Gene Prediction Methods

– Reviewed the future prospects and application strategies of support vector machines, neural network and heuristic techniques (genetic algorithm, fuzzy logic) based learning combined as hybrid methods for improved annotation of raw genomic data.

**Subjects taken**
2012–2015

(+L) includes laboratory

– Cell and Molecular Biology
– Microbiology
– Genetics
– Biochemistry (+L)
– Gene Expression
– Bioinformatics (+L)
– Protein Engineering
– Probability and Statistics
– Statistical Modelling
– Mathematics I & II
– Discrete Structures
– Bioanalytical Lab.
– Data Analytics
– Computational Neuroscience

## Other

**iGEM** Wet lab team member and content writer for the iGEM IIT Kharagpur team. 2015

**Hackerrank** Author of tutorial problems for Ruby, Python & Linux section. 2015

**en Wikipedia** Experienced editor with over **30** english articles and more than 1600 edits. 2012–2015

**metaKGP** Contributor and administrator of the first Comprehensive campus Wiki. 2015