Gathering and development of training materials & design of course curricula

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Introduction

- Choice of topics
- Update on different projects - different projects, different approaches
- From training materials to course curricula
- Suggestions?

Topics

- Genomics and comparative genomics
- Genetic diversity analysis of germplasm
- Bioinformatics
- Marker-assisted selection and breeding

Genomics and comparative genomics

- By: Theresa Fulton – Institute for Genomic Diversity at Cornell University
- For: global scientists in developing countries
- Objective: update on genomics and comparative genomics; how to benefit from the application in the field of plant breeding and crop improvement

  Comparative Genomics helps us:
  - gain better understanding of how species have evolved and how they are related
  - determine the functions of genes
  - take advantage of information from other organisms

Genomics and comparative genomics

- Approach: project follows up on, and will use the same format as two previously developed learning modules by Cornell University and IPGRI

Genomics and comparative genomics

- Training materials: power points presentation format with definition of terms, illustrations of concepts, photographs, real-life examples, appropriate applications, lists of key references, and other items
- Curriculum: self-tutorial or two-week course

Genomics and comparative genomics

TOPICS INCLUDE:

- Key definitions
- Approaches and methods of comparing genomes
- Potential and limitations
- Levels of looking at conservation (ie. gene order, gene content)
- DNA sequence comparisons
- Uses and applications of comparative genomics
- Examples

→ with emphasis on practical applications

Genetic diversity analysis of germplasm

- By: Christian Poisson – CIRAD
- For: plant breeding researchers/ research program managers
- Objective: how can genome analysis tools be used to characterize and structure genetic resources more efficiently
- Training materials: power point modules
- Curriculum: 2 weeks course with presentations, demonstrations and practicals

Genetic diversity analysis of germplasm

TOPICS:

- DNA biology
- Genetic basis
- Phenotypic diversity
- Molecular marker concept
- DNA libraries
- Genetic diversity
- Implications for management of GR
- Supports for laboratory practice
- Data analysis and software use

Bioinformatics

By: Richard Bruskiewich, IRRI

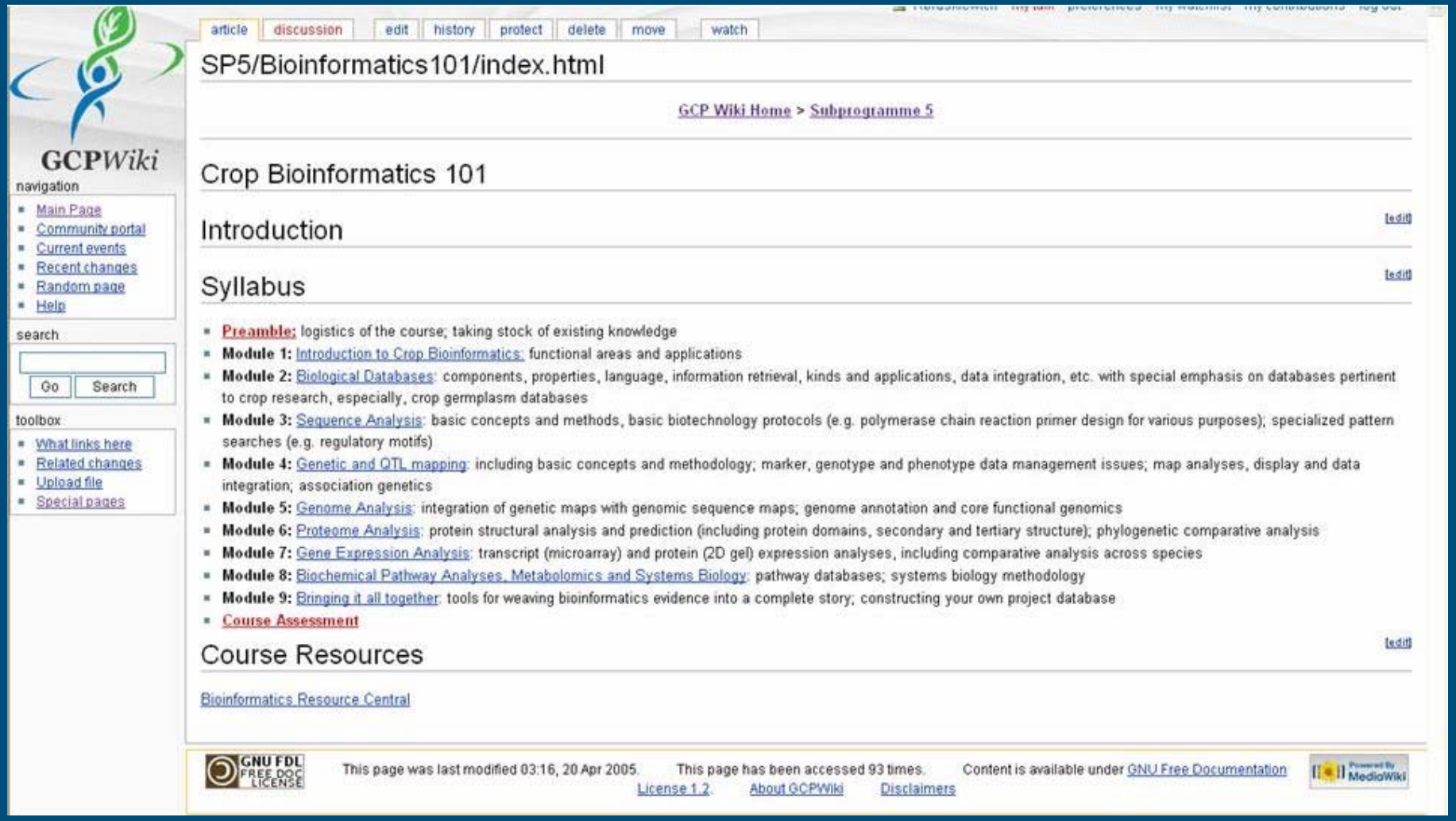
For: scientists with background in germplasm, biology and genetics, with working knowledge of bioinformatics application to plant and agricultural sciences

Objective: to gather/ design course materials as a guide to plant genome informatics and bioinformatics useful for modern plant breeding, genomics and comparative genomics, data analysis and interpretation

Bioinformatics

Approach: Develop and package training materials in a web based distance education course, structured in a modular fashion, with cross references to other publicly available training materials; The CGPWiki course website providing access to the online learning environment, a discussion forum, chat facilities, and email integrated for communications between students and course facilitator, and between students

Bioinformatics



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Bioinformatics

Training materials: Include key references, photographs, illustration of concepts, examples, suggested applications, practical assignments and exercises

Curriculum: self-tutorial or two-week course

Marker-assisted selection and breeding

- By: Daniel Danial, Sjaak van Heusden, and co-workers – Wageningen University; Marja Thijssen – IAC
- For: researchers working with molecular markers in plant breeding and PGR conservation, or those planning to do so in the near future
- Objective: how to use marker technology in solving questions dictated by plant breeding objectives; how to work with marker data for the investigation of genetic diversity, the construction of linkage maps and the identification of QTLs

Marker-assisted selection and breeding

- Approach: Start from training materials developed already at WU, IAC, Cornell University and IPGRI, FAO, etc.
- Training materials: handouts/ files/ power points for introductions, case studies, theoretical exercises, laboratory practicals, computer practicals
- Curriculum: 2 weeks course with presentations, discussions on applications, exercises and practicals

Marker-assisted selection and breeding

TOPICS INCLUDE:

- General Genetics
- Different types of DNA markers with strengths and weaknesses
- Practical applications of marker assisted breeding
- Construction of genetic linkage maps
- QTL analysis
- Bioinformatics
- Laboratory practicals

From training materials to course curricula

- Current status of the projects: training materials are assembled
- Next: Design appropriate curricula from these materials
- Most critical for the success of a course: the participants

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Suggestions?

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