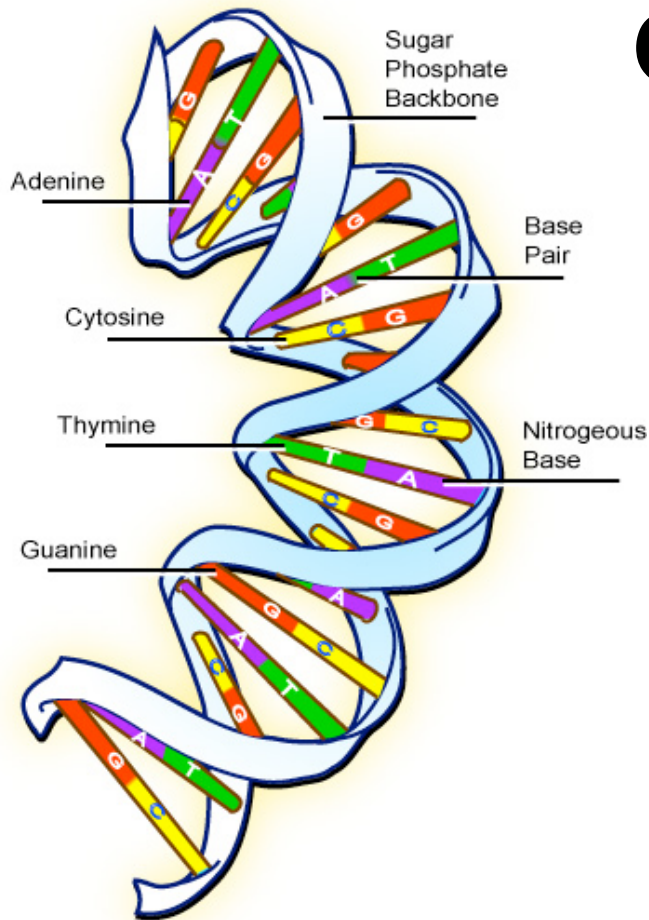


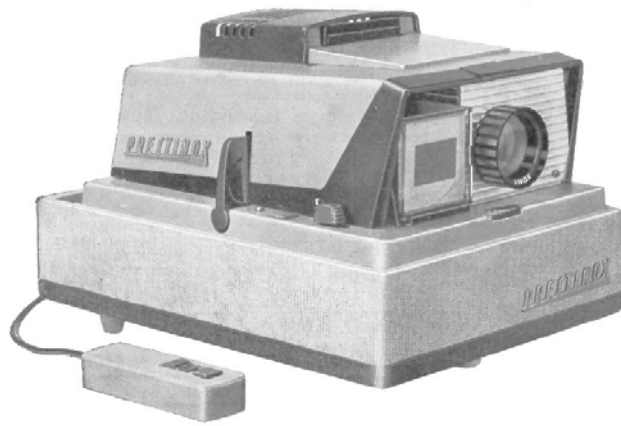
“Re-Imaging Biology: Science, Technology and the Human Genome”



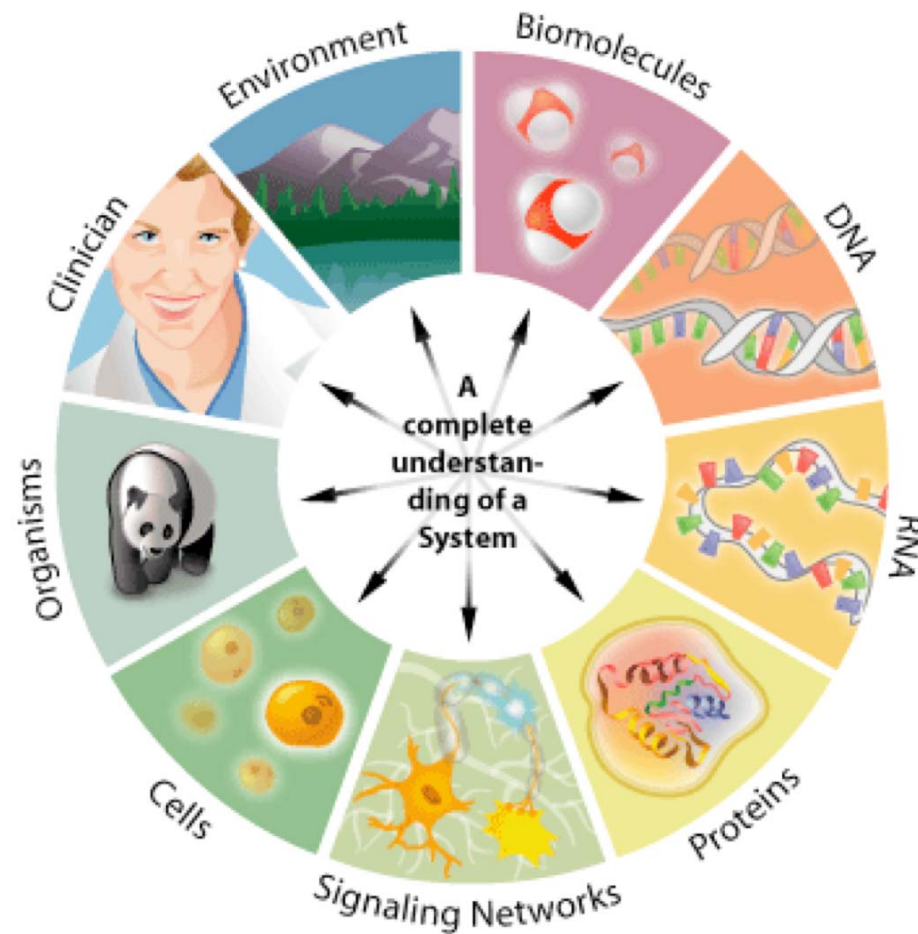
Dr. Joanne Fox
joanne@msl.ubc.ca
<http://bioteach.ubc.ca>

michae | smith
laboratories

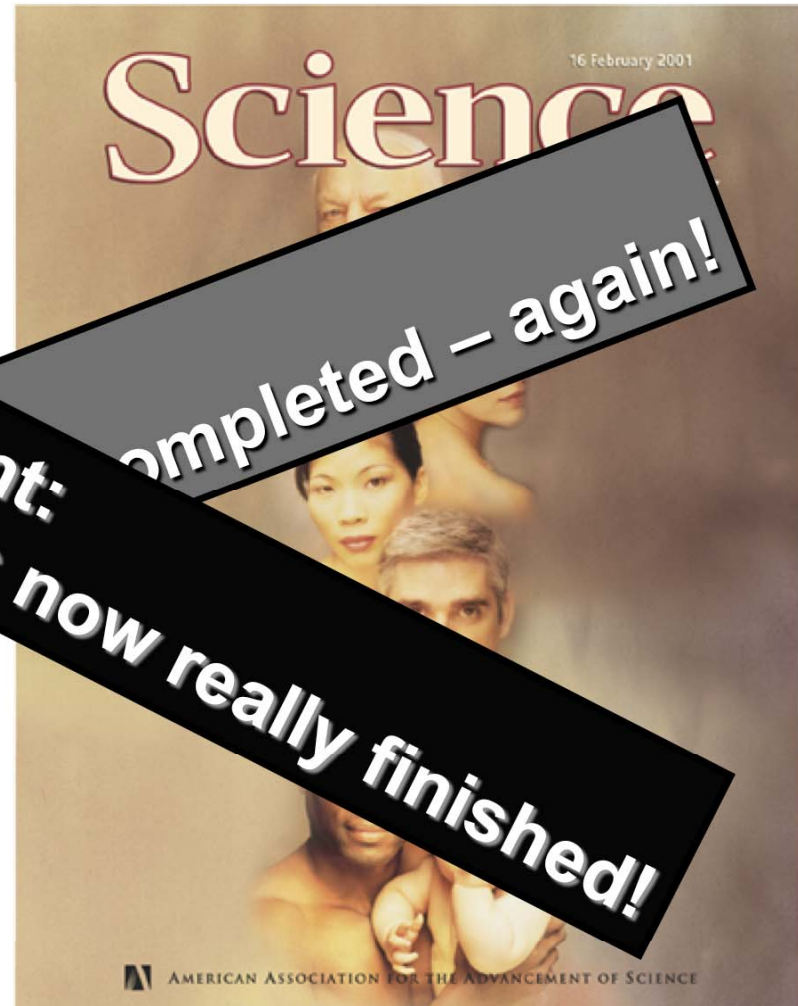
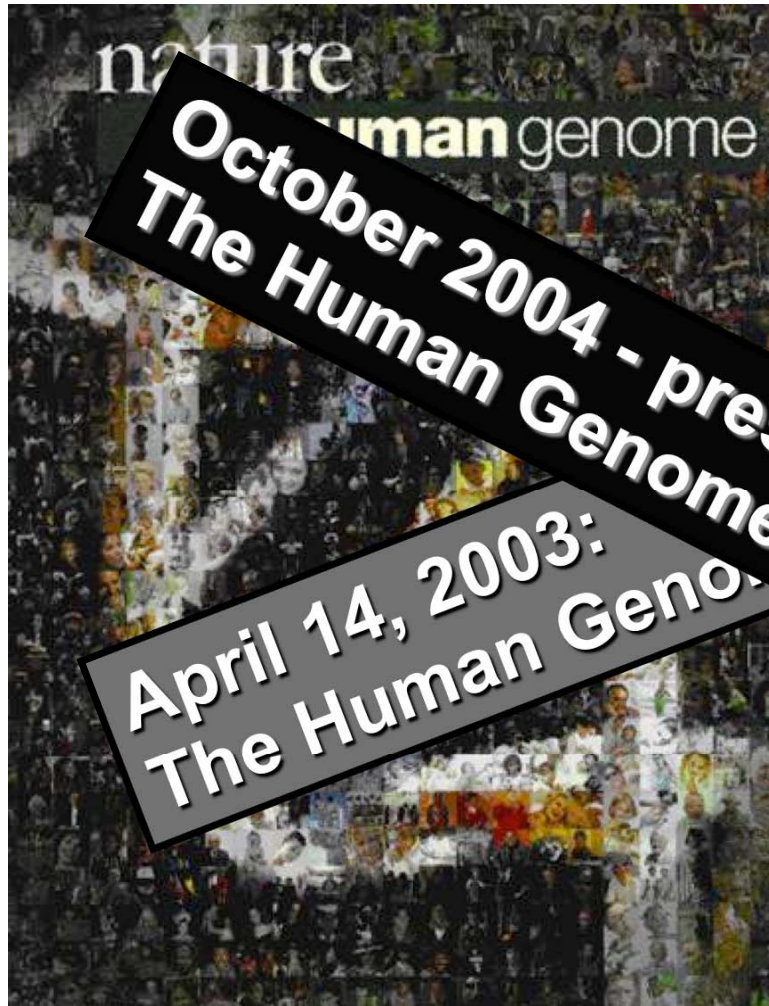
Technology



What is Bioinformatics?

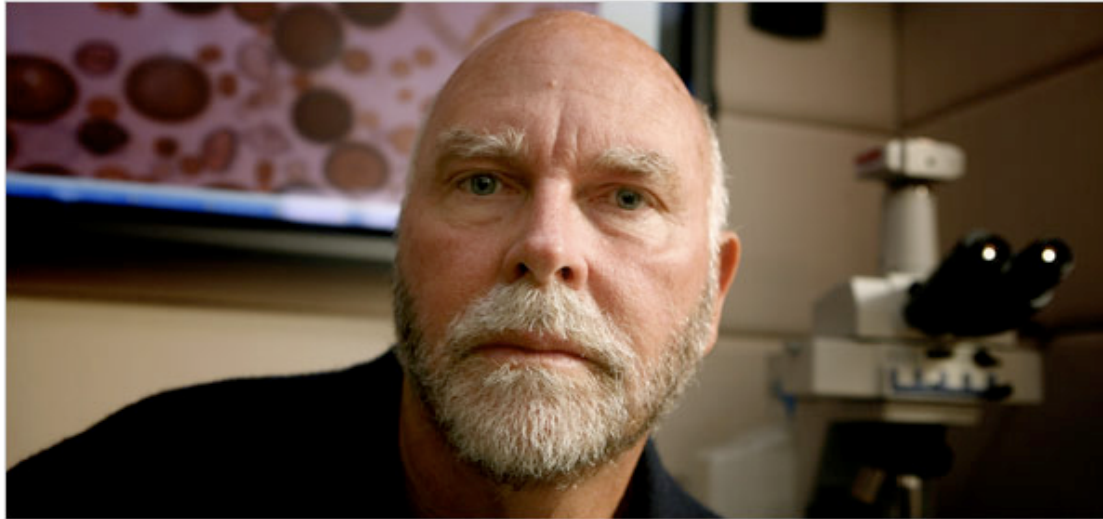


The Human Genome Project



February 2001: Completion of the Draft Human Genome

In the Genome Race, the Sequel Is Personal



Thor Swift for The New York Times

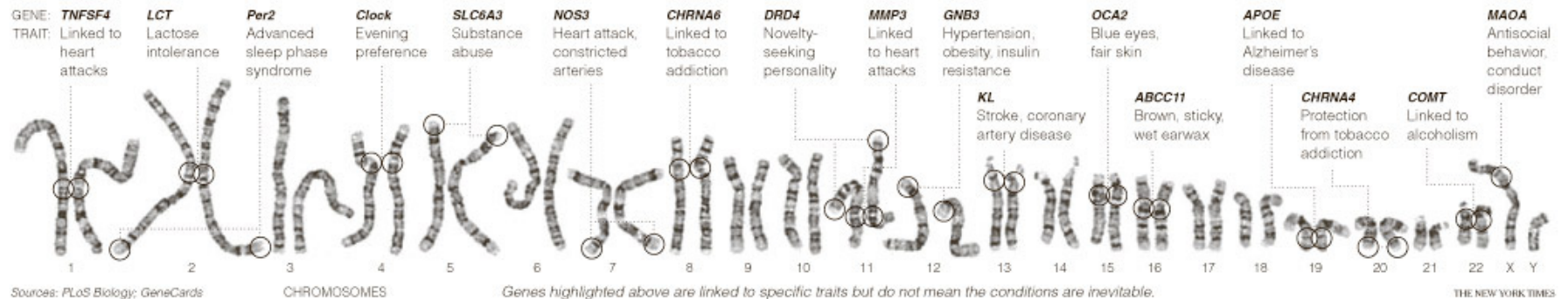
A team led by J. Craig Venter, above, has finished the first mapping of a full, or diploid, genome, made up of DNA inherited from both parents. The genome is Dr. Venter's own.

PHOTOGRAPH BY

The New York Times

September 3, 2007

DECODING HIMSELF A team led by J. Craig Venter, above, has finished the first mapping of a full, or diploid, genome, made up of DNA inherited from both parents. The genome is Dr. Venter's own.



To carry the sequence of my genome in my pocket, I need:

(A) supercomputer

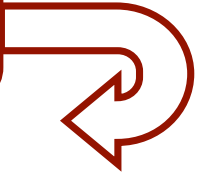
(B) my laptop (brand new)

(C) my home computer (Oops, it's old)

(D) DVD

(E) CD

(F) floppy disk



If compressed, the 3GB human genome will also fit on a single CD

The Human Genome...By the Numbers

- **75-100 trillion...**Cells in the human body
- **3.1 billion...**Base pairs in each cell
- **2.4 million...**Base pairs in the largest human gene
- **28,000-35,000...**Genes in the human genome
- **46...**Chromosomes in each cell



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coffee 2185 East Mall, Vancouver, BC

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Search Results My Maps

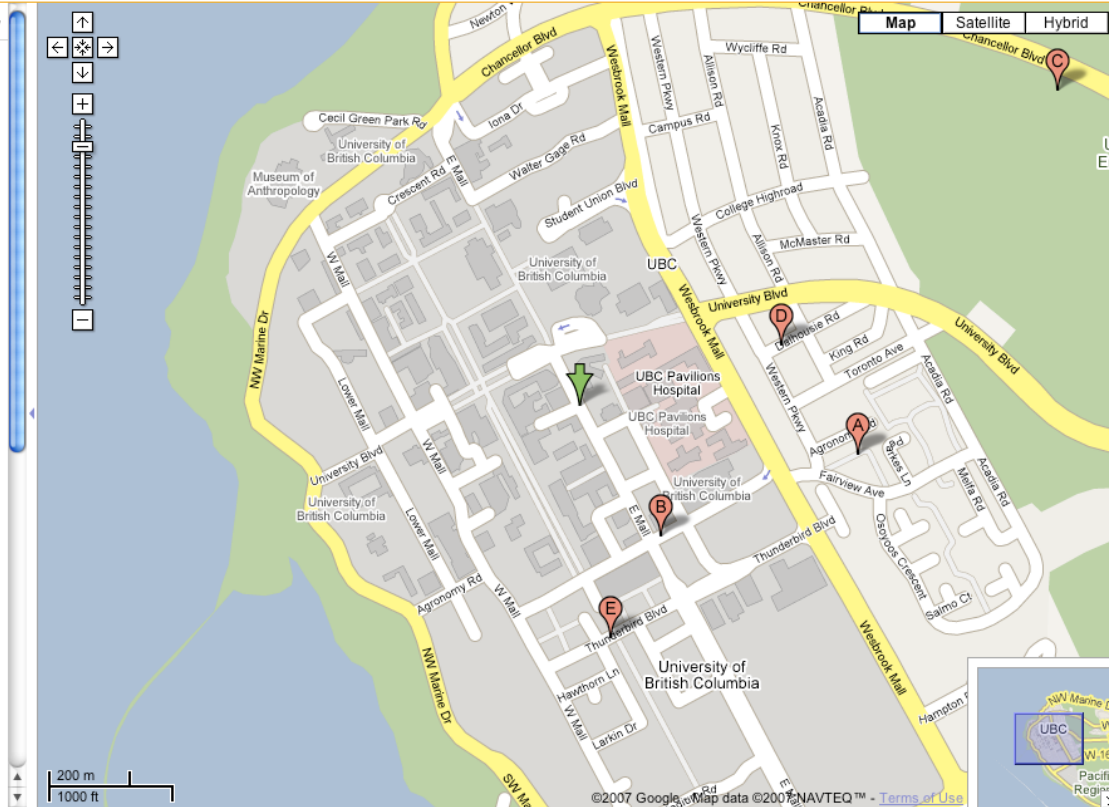
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[Text View](#) [Map View](#)

Results 1-10 of about 6,156 for coffee near 2185 E Mall, UBC, BC V6T - [Modify search](#)

Categories: [Coffee Retail](#), [Coffee Houses](#)

- A** [Original Beanery The](#) - [more info »](#)
2706 Fairview Crescent, Vancouver, BC V6T 2B9
(604) 224-2326 - 0.7 km E
Category: Coffee Houses
- B** [Starbucks Coffee Co](#) - [more info »](#)
6190 Agronomy Road, Vancouver, BC V6T 1Z3
(604) 221-6434 - 0.4 km SE
- C** [Blue Chip Cookies](#) - [more info »](#)
6138 Sub Boulevard, Vancouver, BC V6T 2A5
(604) 822-6999 - 1.4 km NE
Category: Coffee Houses
- D** [Starbucks Coffee Co](#) - [more info »](#)
5761 Dalhousie Road, Vancouver, BC V6T 2H9
(604) 221-0200 - 0.5 km E
- E** [Salt Spring Coffee](#) - [more info »](#)
6308 Thunderbird Blvd, Vancouver, BC V6T 1Z4
(604) 221-6400 - 0.6 km S
- F** [Starbucks Coffee Co](#) - [more info »](#)
4580 10th Avenue West, Vancouver, BC V6R 2J1
(604) 222-1456 - 2.8 km E
- G** [European Crepe Cafe](#) - [more info »](#)
4544 West 10th Avenue, Vancouver, BC V6R 2J1
(604) 221-4240 - 2.8 km E



Let's Look at the Human Genome...

UCSC Genome Browser on Human May 2004 Assembly

move <<< << < > >> >>> zoom in 1.5x 3x 10x base zoom out 1.5x 3x 10x

position chr7:127,471,196-127,495,720 jump clear size 24,525 bp. configure

chr7 (q32.1)

Base Position	127475000	127480000	127485000	127490000	127495000
STS Markers	STS Markers on Genetic (blue) and Radiation Hybrid (black) Maps				
Gap	Gap Locations				
Known Genes (Nov 22, 04)	Based on SWISS-PROT, TrEMBL, mRNA, and RefSeq				
LEP	Consensus CDS				
CCDS	RefSeq Genes				
RefSeq Genes	AceView Gene Models With Alt-Splicing				
Acembly Genes	Human mRNAs from GenBank				
U43653	BC060630				
BC069323	BC069452				
BC069527	AF068123				
	D49487				
	U18915				
Spliced ESTs	Human ESTs That Have Been Spliced				
Conservation	Hu/Chimp/Mouse/Rat/Dog/Chick/Fugu/Zfish Multiz Alignments & Conservation				
chimp	dog				
mouse	rat				
chicken	fugu				
zebrafish	Simple Nucleotide Polymorphisms (SNPs)				
SNPs	Repeating Elements by RepeatMasker				
RepeatMasker					

move start < 2.0 > Click on a feature for details. Click on base position to zoom in around cursor. Click on left mini-buttons for track-specific options.

move end < 2.0 >

Google
“Genome Browser”

Doing a Search

Human (*Homo sapiens*) Genome Browser Gateway

The UCSC Genome Browser was created by the [Genome Bioinformatics Group of UC Santa Cruz](#).
Software Copyright (c) The Regents of the University of California. All rights reserved.

clade	genome	assembly	position or search term	image width	
Vertebrate ▾	Human ▾	Mar. 2006 ▾	chrX:151,073,054-151,383,976	620	<input type="button" value="submit"/>
Click here to reset the browser user interface settings to their defaults.					
<input type="button" value="add custom tracks"/>		<input type="button" value="configure tracks and display"/>		<input type="button" value="clear position"/>	

enter a gene name, press the submit button to search.

About the Human Mar. 2006 (hg18) assembly ([sequences](#))

The March 2006 human reference sequence (NCBI Build 36.1) was produced by the International Sequencing Consortium.

Sample position queries

A genome position can be specified by the accession number of a sequenced genomic clone, an mRNA or EST or STS marker, or a cytological band, a chromosomal coordinate range, or keywords from the GenBank description of an mRNA. The following list shows examples of valid position queries for the human genome. See the [User's Guide](#) for more information.

Request:

chr7
20p13
chr3:1-1000000

Genome Browser Response:

Displays all of chromosome 7
Displays region for band p13 on chr 20
Displays first million bases of chr 3, counting from p arm telomere

check out the number of other genomes available


Moving Around

Home Genomes Blat Tables Gene Sorter PCR DNA Convert Ensembl NCBI PDF/PS Session Help

UCSC Genome Browser on Human Mar. 2006 Assembly

move <<< << < > >> >>> zoom in 1.5x 3x 10x base zoom out 1.5x 3x 10x

position/search chrX:151,073,054-151,383,976 jump clear size 310,923 bp. configure

chrX (q28) 

chrX:	151150000	151200000	151250000	151300000	151350000
UCSC Gene Predictions Based on RefSeq, UniProt, GenBank, and Comparative Genomics					
GABRA3					CS2663821
RefSeq Genes					
Mammalian Gene Collection Full ORF mRNAs					
Human mRNAs from GenBank					
Human ESTs That Have Been Spliced					
Vertebrate Multiz Alignment & PhastCons Conservation (28 s					
Mammal Cons					
Rhesus					
Mouse					
Dog					
Horse					
Armadillo					
Opossum					
Platypus					
Lizard					
Chicken					
X_tropicalis					
Stickleback					
Simple Nucleotide Polymorphisms (dbSNP build 128)					
SNPs (128)					
Repeating Elements by RepeatMasker					

Click here for details. Click here

Try the zoom in, zoom out buttons

Notice that the position/search box tells you exactly where you are

The red bar on the chromosome ideogram gives you the "You Are Here"

The picture below is an expanded view of this "You Are Here" region

www.bioteach.ubc.ca

✓ Today's Talk!

www.bioteach.ubc.ca/catalyst2008/

✓ High School Field Trip Programs

✓ 2008 MSL Teacher Conference,
October 2008

// home

LATEST POST

THE SCIENCE CREATIVE



LITERACY SYMPOSIA

New Science & Creative Writing Field Trip for Kids

The Science Creative Literacy Symposia is a new field trip program offered at the University of British Columbia, and is designed to provide an engaging outreach experience for students at the Grade 6/7 level. Here, the intent is to combine elements of science exploration with expository creative writing with the aim of fostering skills in [...]

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FEATURED POST



MICHAEL SMITH LABS TEACHER CONFERENCE 2008

Presented by the Michael Smith Laboratories, Science World, and Genome BC, **Creative Teachers Experimenting with Science** attend the Michael Smith Laboratories Teacher Conference. In 2008, our theme is **IT'S YOUR EXPERIMENT!** As in previous years, this conference will be held on the province wide Pro-Day in October 2008 at UBC.

ASIDES



Come hear Dr. Joanne Fox this weekend at the Catalyst 2008 conference in Kelowna, BC. Joanne is delivering a talk entitled, "Re-imagining Biology: Science, Technology and the Human Genome" in a featured session of the conference, 11:30 – 12:30 Saturday, April 26th. We'll see you there! #

Thanks to everyone who attended our "MOST EXCEPTIONAL ESCAPADES IN

WE'RE ABOUT THE TALKING OF SCIENCE...

This is the website for the UBC Advanced Molecular Biology Laboratory, a bit of a mouthful that is probably not quite the best at reflecting what we're all about. If you're already familiar with us, the categories listed below should be good for navigation. You can also check out the small images under our websites & programs for more information about our online initiatives that are well worth a visit. But if you're not that familiar with us, why don't we take a moment to pick our name apart.

OUR WEBSITES & PROGRAMS



HIGH SCHOOL FIELD TRIP PROGRAM [SCHEDULE]



Terry* – Science & Arts from a Global Perspective



The Science Creative Quarterly - A Worthy Cause Indeed



FILTER – Media to help you, help others "GET" Science



CATEGORIES

- HIGHSCHOOL →
- PROFESSIONAL →
- STUDENTS →
- TEACHERS →
- TEXTBOOK →
- UNIVERSITY →

MOST POPULAR

- MOLECULAR BIOLOGY WORKSHOPS
- EXPERIMENT #2: Analysis of DNA by Restriction Enzyme Cleavage and Agarose Gel Electrophoresis
- EXPERIMENT #3: Preparation and Isolation of High Molecular-Weight DNA from Onion Tissue.
- EXPERIMENT #1: Transformation of Bacteria from Antibiotic-Sensitive to Antibiotic-Resistant Characteristic.

2008 MSL Teacher Conference

Presented by the Michael Smith Laboratories,
Engaging Science, and Genome BC

IT'S YOUR EXPERIMENT!



Are you a creative teacher who experiments with science? Then plan to attend the 2008 Michael Smith Labs Teacher Conference.



During this unique conference you will:

1. interact with scientists
2. participate in fun science literacy activities
3. collaborate with other teachers
4. build your own interactive science activities for the classroom



The two-day conference will be held on Friday & Saturday October 24–25th, 2008. Come for just one day or stay for two—the choice is yours.

Attending the 2008 MSL Teacher Conference is easy. Registration is free and a limited number of travel awards are available. We'll send you more details as the event gets closer but for now...

Save the dates & we'll see you in October 2008!

www.bioteach.ubc.ca/teacher-conference-2008

Websites visited for Genome Browser Activity:

- Google www.google.ca
- Google Maps <http://maps.google.ca>
- UCSC Human Genome Browser Gateway
<http://genome.ucsc.edu/cgi-bin/hgGateway>
- (hint: use google to look up “Genome Browser”)

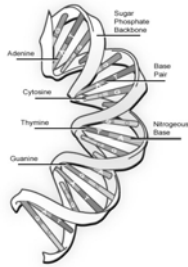
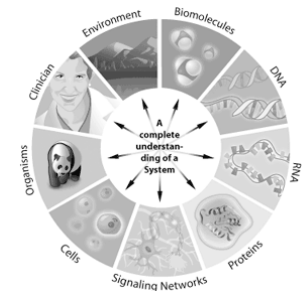


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iPod nano Image available from: <http://www.apple.com/ipodnano/>

Kelowna Hotel and nearby coffee shops in area map Available from: <http://maps.google.ca/>

A view of the Leptin Precursor Gene in the UCSC Genome Browser Available from: <http://genome.ucsc.edu/cgi-bin/hgTracks?hgsid=98731626&hgt.outl=1.5x&position=chr7%3A127669698-127691768>

- Questions? Please contact:

Dr. Joanne Fox

Michael Smith Laboratories

joanne@msl.ubc.ca