



NSF-IGERT COMPUTATIONAL MOLECULAR BIOLOGY TRAINING PROGRAM

GRADUATE TRAINEE HANDBOOK

FALL 2007

IOWA STATE UNIVERSITY

**National Science Foundation (NSF)
Integrative Graduate Education and Research Training (IGERT) Program**

First, a bit about IGERT

The Integrative Graduate Education and Research Traineeship (IGERT) program, which is funded by the National Science Foundation, seeks to train PhD scientists and engineers with the interdisciplinary background and the technical, professional and personal skills needed to address the global questions of the future. Through the use of innovative curricula and internships, and by focusing on problem-centered training, these programs give their graduates the edge needed to become leaders in their chosen fields.

(The above is from the official NSF-IGERT website, <http://www.igert.org>, where you can learn much more about the program. Check it out!)

And then a (very brief!) bit of history about our project

In 2005, Iowa State University (ISU) and New Mexico State University (NMSU) were awarded a five-year \$3 million National Science Foundation (NSF) Integrative Graduate Education and Research Training (IGERT) grant for computational molecular biology. The grant, which was secured by a team of ISU and NMSU faculty, builds on a previous \$2.6 million IGERT grant awarded to ISU in 1999 and supports continuing growth at ISU and NMSU in the burgeoning fields of bioinformatics and computational biology.

A major outcome of the initial funding period was the establishment of ISU's interdepartmental graduate program in Bioinformatics and Computational Biology (BCB), which currently enrolls sixty PhD students. The initial grant provided traineeships for thirty graduate students majoring in BCB, biophysics, chemical engineering, computer science, electrical engineering and genetics, as well as significant funding for computational biology hardware, software and support personnel.

The principal goals for the current NSF IGERT grant are to lead the field of computational biology into the next era of discovery and to educate a diverse group of professionals to spearhead this effort. These goals are being achieved through a partnership between ISU and a similar emerging effort at NMSU, the Center for Research Excellence in Bioinformatics and Computational Biology (BCB).

The ISU-NMSU partnership is synergistic. Faculty share common research interests, which encompass genome informatics, macromolecular dynamics and interactions, and metabolomics and regulatory networks. Research collaborations are already in place between ISU and NMSU, including a commitment to partner in bioinformatics graduate training.

More than ninety ISU and NMSU faculty members engage in bioinformatic, computational biology and biological statistics research. The institutions' extraordinary success in fostering

a highly collaborative research environment is manifested by the large number of interdisciplinary and interinstitutional research projects in bioinformatics and computational biology.

In addition to the primary ISU-NMSU partnership, this project also partners the schools with Pioneer Hi-Bred, International, as well as with Sandia National Laboratories and the National Center for Genome Resources (NCGR), which provide internship opportunities for ISU and NMSU students. Students also can take advantage of international research opportunities at Bielefeld University in Germany.

Through the IGERT grant, we are able to provide not only direct financial support for trainees, but also support for some of the things that benefit the broader computational molecular biology community and help make quality research possible – such as equipping computer labs, making sophisticated software available and bringing world-renowned scientists to campus.

Why you have been selected as an IGERT trainee, and what's expected of you

Many factors are considered in selecting IGERT trainees. The purpose of our IGERT project is to train top-notch scientists in the interdisciplinary field of computational molecular biology, so we of course seek out students who have a solid and suitable academic background complemented with good research experience, who have demonstrated they have what it takes to succeed.

Trainees are expected to conduct interdisciplinary research involving both molecular biology and a quantitative science, which may be computational, mathematical or statistical.

Trainees are expected to work just a little harder, probe just a little more deeply, reach just a little farther, think just a little more creatively and collaborate just a little more globally.

Trainees are expected to become leaders in the field of computational molecular biology.

What your IGERT traineeship provides

The NSF IGERT traineeship in Computational Molecular Biology is a competitive award that provides two years of financial support to qualifying PhD students. During this two-year period, the IGERT traineeship pays the research stipend, tuition, fees and health insurance. IGERT also provides each trainee a discretionary Cost of Education (COE) fund for educational purposes. This fund can be used, for example, for computer hardware and software, textbooks, scientific journals or short training courses. The traineeship also provides travel funds to encourage participation in professional conferences.

Continued IGERT support is contingent upon remaining in good academic standing and making satisfactory progress toward the degree. If a trainee transfers from a PhD program to an MS program, the IGERT traineeship benefits will be forfeited.

At the end of the two-year IGERT funding period, the trainee's major professor or home department assumes responsibility for funding the student. Regardless the funding source, students are considered to be IGERT trainees throughout the course of their study at Iowa State. Any funds remaining in a trainee's COE and travel accounts at the end of the initial two year traineeship are carried forward and may be used in subsequent years, until either graduation or expiration of the IGERT grant.

Trainees should note that, in most cases, research assistantships provided by major professors or departments after the conclusion of the IGERT traineeships will not match the level of funding provided by IGERT. It is important, therefore, that trainees plan ahead and use wisely the generous financial support that is provided during the two years of the IGERT traineeship.

Administrative support

The IGERT program is overseen by the director and program assistant, who serve as resources for IGERT trainees throughout graduate study. Trainees are encouraged to contact the director or program assistant for further information about traineeship funding, requirements and opportunities.

Overseeing the IGERT project at ISU:

Dan Voytas, Director
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Overseeing the IGERT project at NMSU:

Desh Ranjan, Director
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Las Cruces, NM 88001
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IGERT on the web

Our IGERT project website is <http://igert.iastate.edu>.

GETTING STARTED

Orientation and registration

Many graduate programs at Iowa State University begin the academic year with a Graduate Student Orientation held during the week prior to the start of Fall semester classes. Sometime during this orientation week, new IGERT trainees will have an opportunity to meet with the IGERT director and current IGERT trainees. The director serves as trainees' IGERT advisor throughout the course of their graduate work at Iowa State. Prior to registering for Fall courses, IGERT trainees will meet with the IGERT director to become familiar with the IGERT course requirements and for assistance in schedule planning.

IGERT COURSE AND TRAINING REQUIREMENTS

IGERT requirements, in some cases, overlap the student's major program requirements. In other cases, IGERT requirements are in addition to major program requirements.

Laboratory exploration rotations

A key aspect of the IGERT program is participation in research exploration rotations. The rotations serve several purposes. In addition to helping students choose their future major professors and professors choose graduate students, exploration rotations provide students an opportunity to actively participate in research projects and promote interaction and exchange of information among research groups. Because rotations are necessarily brief, students are

not usually able to "complete" a project, in either a biological or computational research group. Instead, during the research exploration rotation period, students should use this time to:

- get to know the professor, students and postdoctoral research trainees working in the research group;
- learn as much as possible about the professor's research projects;
- obtain hands-on experience in one of the group's research projects;
- attend research group meetings and journal club meetings; and
- read reprints, reviews and grant proposals related to the group's research.

It is appropriate for a rotating student to ask the rotation advisor whether the advisor would consider accepting him/her as a graduate student, but the final decision should not be made until all rotations have been completed.

Participation in three research exploration rotations is required for all first year IGERT trainees. At least one rotation must be a "wet" laboratory experience (usually in a biological science laboratory using molecular biological, biophysical or biochemical techniques). At least one rotation must involve a strong computational component (usually in a research group in computer science, mathematics, physics, statistics or engineering). Students are strongly encouraged to participate in rotations in at least two different departments, and *rotations must include laboratories in more than one collaborative research group.*

Beginning in Orientation Week and during the BCB Fall Faculty Seminar Series (BCB 691), students will have an opportunity to meet individual faculty members and discuss their research. Students should arrange individual appointments to discuss rotation possibilities with the professors whose work interests them.

Students should make use of the following resources in selecting research groups and professors with whom to rotate:

- the list of faculty who have expressed an interest in serving as mentors for research exploration rotation students, available on the BCB website at http://www.bcb.iastate.edu/courses/current_rotations_07.htm;
- homepages of individual Baker Center faculty at <http://www.bioinformatics.iastate.edu/faculty/contact.html>;
- discussions with individual faculty members (faculty can provide curriculum vitae, recent publications and grant proposals);
- research talks given by faculty in the BCB Fall Faculty Seminar series and in the various departmental seminars on campus;
- discussions with current IGERT trainees.

Students should compile a list of several faculty members with whom they would like to rotate; this can be done in consultation with the IGERT director. Students should personally contact the faculty members to determine whether they are accepting rotation students and to schedule a rotation.

To assist both faculty and students in planning, students should attempt to schedule exploration rotations as early as possible. The length of each rotation typically is eight weeks. **Adherence to the following timetable is strongly recommended. Students should notify the IGERT office of their rotation choices on or before the beginning of each rotation period, and of the final lab decision by April 12.**

LAB EXPLORATION ROTATION TIMETABLE	
Rotation 1	September 11 – November 2
Rotation 2	November 5 – December 28
Rotation 3	December 14 – March 15
Deadline for final lab decision	April 12
Deadline for filing Home Department form	April 26

If a student realizes within the first two weeks of a rotation exploration that the rotation experience is not in an area of research he or she wishes to pursue, the student should consult with the IGERT director, who can provide help in arranging another exploration rotation if assistance is needed.

Choosing a major professor and establishing a home department

Much of the first year will be devoted to the important process of selecting a major professor. After completing research exploration rotations, students should contact potential major professors to discuss the possibility of joining their laboratories. For administrative purposes, the major professor's department becomes the student's home department. After choosing a major professor, students enrolled in interdisciplinary graduate programs must file a *Request to Establish a Home Department for Students Admitted to Interdepartmental Majors* form (Appendix D).

Some important notes about selecting a major professor:

- ***Students should not feel pressured to make a final decision about their future major professor until all exploration rotations have been completed.*** It is in the student's best interest to reserve a final lab decision until becoming fully informed about all available opportunities. Faculty are ***strongly*** encouraged to wait until new IGERT trainees have had an opportunity to complete all rotations before making a commitment to any specific student.
- ***It is CRITICAL that students discuss their future research assistantship support with potential major professors.*** During the exploration rotation period and throughout the first two years, IGERT trainees are supported as Research Assistants (RAs) with funds provided by the NSF IGERT traineeships. After the end of the IGERT-funded years, responsibility for the student's assistantship funding lies with the major professor and home department.

When a faculty member agrees to serve as a trainee's major professor, s/he is expected to arrange assistantship support for the remainder of the student's degree program, as long as the student remains in good standing and is making good progress toward the degree. Because much research funding is grant related, very few professors are able to "guarantee" a specific source of graduate assistantship support for several years. It is important, therefore, that each student take an active role in discussing future assistantship funding with the major professor. Most students receive support as either a Research Assistant (RA) or a Teaching Assistant (TA), with funding supplied by the major professor and/or the home department. In some cases, students receive support from other sources, such as scholarships, training grants, or competitive research assistantships.

As noted previously under *What Your IGERT Traineeship Provides*, trainees should be aware that, in most cases, research assistantships provided by major professors or departments after the conclusion of the IGERT traineeships will not match the funding level of the initial two years of IGERT support.

Choosing a co-major professor

IGERT requires that the major and co-major professor – **one from the biological sciences and one from the computational/quantitative sciences** – actively serve as joint mentors for the trainee.

The co-major professor plays an integral role in the mentoring of IGERT trainees. Oftentimes, major and co-major professors have active research collaborations, and IGERT PhD projects emerge from these joint research efforts. If this is not the case, it is still expected that the co-major professor will meet regularly with the IGERT trainee to provide input and help guide the dissertation research. The selection of a co-major professor, therefore, is an important decision and should be given careful consideration. The major professor will assist the student in choosing an appropriate co-major professor.

The co-major professor must be chosen prior to filing the *Recommendation for Committee Appointment* form (Appendix E). Co-major professors typically do not provide assistantship funding.

Appointing a Program of Study (POS) Committee

After choosing the major and co-major professors and establishing a home department, students should begin planning a suitable program for completion of their graduate coursework. Before the end of the first year, students should appoint a graduate Program of Study (POS) Committee by filing a *Recommendation for Committee Appointment*.

The POS committee should include faculty members whose knowledge and research interests will aid and complement the student's research interests, as well as faculty whose expertise

will ensure a breadth of knowledge on the committee. The POS PhD committee must include at least five members of the Graduate College Faculty. The composition and responsibilities of the POS committee must be in accordance with the guidelines of the Graduate College and the trainee's home department.

Coursework and the Program of Study

In consultation with the major and co-major professor, trainees prepare a coursework plan for completing their degree program. The final content of this *Program of Study* (Appendices F and G) must be discussed and approved by the student's Program of Study Committee. All committee members must be present at this initial POS meeting, which should take place before the end of the first semester of the second year.

Required Core Courses

At least one core course in Molecular Biology:

~~Gen 411, 3 cr, OR~~

GDCB 511, 3 cr

And at least one core course in Computational Biology:

BCB 567 Fundamentals of Genome Informatics, 3 cr, **OR**

BCB 568 Advanced Genome Informatics, 3 cr, **OR**

BCB 569 Structural Genome Informatics, 3 cr, **OR**

BCB 570 Computational Functional Genomics and Systems Biology, 3 cr

Required Seminars and Activities

BCB 593 Workshop (at least 2 required)

BCB 691 Faculty Seminar (Fall) (at least 1 required)

BCB 690 Student Seminar (Spring) (at least 2 required; 2 oral presentations required)

Scientific Ethics Workshop (during Fall Orientation)

Bioethics Training: *IGERT trainees are required to take at least two bioethics modules or another IGERT-approved bioethics course (1 credit minimum). The required sessions in general scientific ethics offered during Fall orientation (above) do not count toward this bioethics course requirement.*

Agron/Gen/PIP 565A Professional Practices in Research, .5 cr, S

Agron/Gen/PIP 565B Intellectual Property and Industry Interactions, .5 cr, S

Annual Joint Bioinformatics Symposia: *Iowa State University and New Mexico State University participate in an annual bioinformatics symposium in which IGERT trainees are required to participate at least twice during the course of their graduate work. The primary objectives of the symposia are to:*

- *strengthen the core of bioinformatics research at the participating universities;*
- *encourage interaction and collaboration with and among computational biologists at the institutions;*
- *strengthen the IGERT partnership between Iowa State and New Mexico State University; and*
- *provide opportunities for students to hone their poster and oral presentation skills.*

GPA requirements

If a student's cumulative grade point average (GPA) for all coursework taken falls below 3.0, the student is placed on academic probation by the Graduate College. (Exception: "New first-term graduate students who fall below a 3.0 GPA at the end of their first semester will be given a one term grace period to bring their grades back to a 3.0 GPA.") According to the Graduate College policy, "If a student is to qualify for a tuition scholarship, he/she must be removed from probation by the tenth class day of the term."

If an IGERT trainee fails to maintain a cumulative GPA of 3.0 for all coursework taken, the trainee will be allowed a one semester grace period in which to raise his/her cumulative GPA to 3.0. During this grace period, IGERT will continue to provide the research stipend but will not cover tuition, and the trainee's use of IGERT Cost of Education funds and travel funds will be suspended. If, at the end of the semester the trainee has raised his/her cumulative GPA to 3.0 or above, the student's IGERT traineeship will be fully reinstated. If, however, the trainee has failed to achieve a cumulative GPA of 3.0 for all courses taken, or if at any time the trainee has a second occurrence of GPA below 3.0, the IGERT traineeship will be completely and fully terminated and will not be reinstated.

Preliminary examination

The Graduate College requires that all Ph.D. students pass a Preliminary Examination before advancing to candidacy for the doctoral degree. To initiate this process, the student must file a *Request for Preliminary Examination* form (Appendix H, available from department and program administrative offices and the Graduate College). **The Preliminary Examination should be held by the first semester of the third year.**

IGERT annual interview and the IGERT Requirements Checklist

IGERT trainees meet individually with the IGERT director at least once each year throughout graduate training. The annual IGERT interview provides an opportunity to note the past year's achievements as well as any difficulties the trainee may be encountering, and to ensure that the student's degree program is on track. It also enables the program to help students address problems before the problems become major.

The *IGERT Requirements Checklist* (Appendix I) is one of the most important tools for tracking progress in meeting IGERT requirements. Trainees complete the form and bring it to each year's interview with the IGERT director. It is recommended that trainees retain an electronic copy of the completed form so that it can easily be updated each year.

Thesis seminars

Most graduate programs require that PhD students present a thesis seminar that is open to the university community. Trainees are encouraged to attend other students' seminars to expand their scientific background and support their colleagues.

At least two weeks prior to the thesis seminar, trainees should provide the following information to the IGERT office:

- seminar title
- seminar abstract
- seminar date, time and location

Graduating and moving on

Before leaving campus to pursue the Nobel laureateship, trainees should contact the IGERT director to schedule a brief exit interview to discuss plans for the future and provide program input. Students also will be asked to complete a brief *Alumni Information Form* to help the IGERT program remain in contact and track trainees' careers.

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* Form is available on the Graduate College forms page at
<http://www.grad-college.iastate.edu/forms/forms.html>

Appendix A

IGERT Trainees Fall 2007

<i>Last Name</i>	<i>First Name</i>	<i>Major</i>	<i>Dept</i>	<i>Major Professor/s</i>	<i>Campus Address</i>	<i>Office or Cell Ph</i>	<i>Email @ iastate.edu</i>
Andorf	Carson	Com S	Com S	Honavar/Dobbs	215 Atanasoff	294-4377	andorf@iastate.edu
Boyken	Scott	BCB					sboyken
Donnelly	Jennifer	Agron	Agron	Dekker/Ashlock	3010 Agron	451-6469	poppet@iastate.edu
Doty	David	BCB, ComS	Math	Ashlock/Mayfield	226 Atanasoff	294-5445	ddoty@iastate.edu
Farnham	Robert	BCB	ECpE	Aluru/			farnham@iastate.edu
Goodman	Timothy	BCB					tgoodman
Hughes	LaRon	BCB	An Sci	Reecy/Honavar			laron@iastate.edu
Hurst	Jonathan	BCB					jnhurst
Kronmiller	Brent	BCB	Plnt Path	Wise/Gu	409 Bessey	294-2893	bak@iastate.edu
Larson	Nicholas	Stat	Stat	Nettleton/	102 Snedecor	294-3440	nblarson@iastate.edu
Schwartz	Tonia	Genetics					schwartz
Towfic	Fadi	BCB	ComS	Honavar/Bogdanove		563-581-8252	ftowfic@iastate.edu
Vander Velden	Kent	BCB	GDCB	Reilly/Honavar			kent@iastate.edu

Key:

BCB – Bioinformatics and Computational Biology program

ECpE – Electrical and Computer Engineering Department

GDCB – Genetics, Development and Cell Biology Department

APPENDIX B

BAKER CENTER FACULTY Fall 2007

<i>Last Name</i>	<i>First Name</i>	<i>Department</i>	<i>Office Address</i>	<i>Office Ph</i>	<i>Email @iastate.edu</i>
Ackerman	Ralph	Ecology, Evolution & Organismal Biology	601 Science II	294-8676	racker
Adams	Dean	Ecology, Evolution & Organismal Biology; Statistics	241 Bessey	294-3834	dcadams
Aluru	Srinivas	Electrical and Computer Engineering	3218 Coover	294-3539	aluru
Andreotti	Amy	Biochemistry, Biophysics & Molec Biol	4208 Molec Biology	294-4953	amyand
Baum	Thomas	Plant Pathology	351 Bessey	294-2398	tbaum
Bogdanove	Adam J.	Plant Pathology	423 Bessey	294-3421	ajbog
Brendel	Volker	Genetics, Development & Cell Biology	2112 Molec Biology	294-9884	vbrendel
Bronikowski	Anne	Ecology, Evolution & Organismal Biology	253 Bessey	294-7170	abroniko
Brumm	Thomas	Agricultural and Biosystems Engineering	107 Davidson	294-5145	tbrumm
Carriquiry	Alicia	Statistics	102D Snedecor	294-3440	alicia
Chou	Hui-Hsien	Genetics, Development & Cell Biology	503 Science II	294-9242	hhchou
Cook	Dianne	Statistics	325 Snedecor	294-8865	dicook
Davidson	Jennifer	Mathematics; Electrical and Computer Engineering	438 Carver	294-2941	davidson
Dekker	John (Jack)	Agronomy	3214 Agronomy	294-8229	jdekker
Dekkers	Jack	Animal Science	239D Kildee	294-7509	jdekkes
Dickerson	Julie	Electrical and Computer Engineering	3123 Coover	294-7705	julied
Dixon	Philip	Statistics	120 Snedecor	294-2142	pdixon
Dobbs	Drena	Genetics, Development & Cell Biology	2114 Molec Biology	294-1112	ddobbs
Dorman	Karin	Statistics; Genetics, Development & Cell Biology	210C Snedecor	294-8392	kdorman
Eulenstein	Oliver	Computer Science	212 Atanasoff	294-2407	oeulens@cs.iastate.edu
Fernandez- Baca	David	Computer Science	209 Atanasoff	294-2168	fernande
Fernando	Rohan	Animal Science	225D Kildee	294-5348	rohan
Greenlee	M. Heather West	Biomedical Sciences	2070 Veterinary Medicine	294-9251	mheather
Gu	Xun	Genetics, Development & Cell Biology	536 Science II	294-8075	xgu
Ho	Kai-Ming	Astronomy & Physics	A502 Physics	294-1960	kmh@ameslab.gov
Honavar	Vasant	Computer Science	211 Atanasoff	294-1098	honavar@cs.iastate.edu
Hong	Mei	Chemistry	1605 Gilman	294-3521	mhong
Honzatko	Richard	Biochemistry, Biophysics & Molec Biology	4206 Molec Biology	294-7103	honzatko
Huang	Xiaoqiu	Computer Science	226 Atanasoff	294-4377	xqhuang@cs.iastate.edu
Janzen	Fred	Ecology, Evolution & Organismal Biology	343 Bessey	294-4230	fjanzen
Jernigan	Robert	Plant Sciences Institute; Biochemistry, Biophysics & Molec Biology	112 Office and Lab	294-3833	jernigan
Jones	Douglas E.	Veterinary Pathology	2764 Vet Med	294-4682	jonesdou
Koehler	Kenneth	Statistics	120 Snedecor	294-4181	kkoebler
Kothari	Suraj	Electrical and Computer Engineering	3214 Coover	294-7212	kothari
Lamont	Susan	Animal Science	2255 Kildee	294-4100	sjlamont
Lavrov	Dennis	Ecology, Evolution & Organismal Biology	353 Bessey	294-9091	dlavrov
Lawrence	Carolyn	Agronomy	1565 Agronomy	294-7380	triffid
Levine	Howard A.	Mathematics	410 Carver	294-8145	halevine
Macintosh	Gustavo	Biochemistry, Biophysics and Molec Biology	2214 Molec Biology	294-2627	gustavo

Last Name	First Name	Department	Office Address	Office Ph	Email
Maddux	Roger	Mathematics	418 Carver	294-8134	maddux
Mallapragada	Surya	Chemical Engineering	3035 Sweeney	294-7407	suryakm
Mayfield	John	Genetics, Development & Cell Biology	2106 Molec Biology	294-6847	jemayf
Miller	Leslie	Computer Science	227 Atanasoff	294-4377	lmiller@cs.iastate.edu
Miller	W. Allen	Plant Pathology	413 Bessey	294-2436	wamiller
Minion	Chris	Veterinary Microbiology and Preventive Medicine	1130 Vet Med	294-6347	fcminion
Moloney	Kirk A.	Ecology, Evolution & Organismal Biology	253 Bessey	294-6415	kmoloney
Nettleton	Dan	Statistics	111 Snedecor	294-7754	dnett
Nikolau	Basil	Biochemistry, Biophysics & Molec Biol	2210 Molec Biology	294-9423	dimmas
Nilsen-Hamilton	Marit	Biochemistry, Biophysics & Molec Biol	3206 Molec Biology	294-9996	mnh
Nolan	Lisa K.	Veterinary Microbiology and Preventive Medicine	2180 Vet Med	294-5776	lkolan
Peccoud	Jean	Genetics, Development & Cell Biology			jean.peccoud@pioneer.com
Peters	Reuben J.	Biochemistry, Biophysics & Molec Biol	4108 Molec Biology	294-8580	rypeters
Peterson	Thomas	Genetics, Development & Cell Biology	2208 Molec Biology	294-6345	thomasp
Phillips	Gregory J.	Veterinary Microbiology & Preventive Med	202 VMRI Bldg 6	294-1525	gregory
Proulx	Stephen	Ecology, Evolution & Organismal Biology	339 Bessey	294-0272	proulx
Rajan	Krishna	Materials Science and Engineering	2220 Hoover	294-2670	krajan
Reecy	James	Animal Science	2255 Kildee	294-9629	jreecy
Reilly	Peter	Chemical Engineering	2031 Sweeney	294-5968	reilly
Rodermel	Steven	Genetics, Development & Cell Biology	457 Bessey	294-8890	rodermel
Rothschild	Max	Animal Science	2255 Kildee	294-6202	mfrothsc
Sakaguchi	Donald	Genetics, Development & Cell Biology	502 Science II	294-3112	dssakagu
Schnable	Patrick	Agronomy	2035B Carver Co-Lab	294-0975	schnable
Shoemaker	Randy	Agronomy	G401 Agronomy	294-6233	rcsshoe
Smiley	Michael	Mathematics	458 Carver	294-6420	mwsmsiley
Smith	Jonathan	Mathematics	496 Carver	294-8172	jdsmith
Song	Guang	Computer Science	107 Atanasoff	294-1696	gsong
Song	Xueyu	Chemistry	303 Wilhelm	294-4383	xsong
Travesset	Alex	Physics and Astronomy	A503 Physics	294-7191	trvsst@ameslab.gov
Tuggle	Chris	Animal Science	2255 Kildee	294-4252	cktuggle
Valenzuela	Nicole	Ecology, Evolution & Organismal Biology	239 Bessey	294-1285	nvalenzu
Voytas	Daniel	Genetics, Development & Cell Biology	1035A Carver Co-Lab	294-1963	voytas
Wallace	Robert	Ecology, Evolution & Organismal Biology	353 Bessey	294-0367	rwallace
Wendel	Jonathan	Ecology, Evolution & Organismal Biology	353 Bessey	294-7172	jfw
Whitham	Steven	Plant Pathology	351 Bessey	294-4952	swhitham
Willson	Stephen	Mathematics	411 Carver	294-7671	swillson
Wise	Roger	Plant Pathology	409 Bessey	294-9756	rpwise
Wu	Zhijun	Mathematics	370 Carver	294-8165	zhijun
Wurtele	Eve	Genetics, Development & Cell Biology	441 Bessey	294-8989	mash
Yu	Edward	Physics & Astronomy	A115 Physics	294-5440	ewyu@ameslab.gov

APPENDIX C

IGERT REQUIREMENTS AND TIMETABLE

IGERT REQUIREMENTS

Requirement	Course Number (Semester Offered)	Course Name	Ph.D.
Research rotation (first year only)	697 or 699	Research Rotations - at least one wet (biological) lab and at least one dry (computational) lab in at least two different research collaborations	3 labs
Bioethics training	(F) AND Var. (usually S)	Fall Scientific Ethics Workshop AND Approved bioethics course/modules	4 2 sessions and 1 cr
Core courses	Gen 411 or GDCB 511 (S) AND BCB 567 (F) or BCB 568 (S) or BCB 569 (F) or BCB 570 (S) or	Molecular Genetics AND Fundamentals of Genome Informatics Advanced Genome Informatics Structural Genome Informatics Computational Functional Genomics & Systems Biology	3 cr 3 cr 3 cr 3 cr 3 cr
Workshops and symposia	BCB 593 ⁷	BCB Workshop (1 cr each)	2 times
Student research seminars	BCB 690 (S)	BCB Student Research Seminar (1 cr each; 2 oral presentations are required)	2 times
Faculty seminars	BCB 691 (F)	BCB Faculty Research Seminar	1 time

* BCB 593 Workshop is offered various semesters, but at least once each year.

IGERT TIMETABLE AND DEADLINES

Attend Lab Safety Training	Orientation week
Attend Scientific Ethics Workshop	September 18 AND 25
Rotation 1	September 11 – November 2
Rotation 2	November 5 – December 28
Rotation 3	January 14 – March 15
Make major professor decision	April 12
File <i>Home Department</i> form	April 26
File <i>Committee Appointment</i> form NOTE: must appoint two co-major professors, one from the biological sciences and one from the computational/quantitative sciences	Before end of 1 st year
Hold first POS Committee meeting and file <i>Program of Study (POS)</i> form	By 1 st semester of 2 nd year
Hold annual POS meeting	Each subsequent October
Take preliminary examination	By 1 st semester of 3 rd year
Submit thesis to POS committee	2 weeks prior to defense
Provide PhD research seminar information, title and abstract to IGERT office	2 weeks prior to seminar

APPENDIX D

Request to Establish a Home Department for Students Admitted to Interdepartmental Majors

Graduate College • IOWA STATE UNIVERSITY

The graduate student should initiate this request by completing Section 1 of this form and giving it to his/her interdepartmental chair. The Interdepartmental Chair (DOGE) should complete Section 2 and send this form, together with other documents he/she may wish to transmit, by sealed envelope, to the proposed cooperating department. When completed, this form should be sent to the Graduate College, 1137 Pearson Hall, for approval and retention. Copies will be returned to the interdepartmental chair and to the department.

I. Student Information

(Please Type or Print)

I, _____, request admission to the _____ Department, effective _____

(term and year).

My major is [] BCB [] FCS [] Genetics [] Human Computer Interaction [] Immunobiology [] MCDB [] Microbiology [] Plant Physiology [] Neuroscience [] Sustainable Agriculture [] Systems Engineering [] Toxicology.

Degree Sought _____ Date of Request _____

Student's Signature _____ SS# _____

Current Mailing Address _____ Phone _____

Campus Address _____ Email Address _____

II. Interdepartmental Chair Information

The student is enrolled in the _____ interdepartmental major, on a

[] Full [] Provisional [] Restricted basis and is pursuing a [] Ph.D. [] M.S. degree in this interdepartmental major. Major Professor _____

(Please Print)

Comments _____

Signed _____ Date _____ (DOGE of Interdepartmental Major)

III. Proposed Cooperating Department Information

[] Request Denied. I do not agree to accept this student in the _____ Department.

[] Request Approved. I agree to accept this student in the _____ Department.

[] Full [] Provisional [] Restricted basis, having examined his/her undergraduate transcript, graduate record at Iowa State University and the above comments.

Signed _____ Date _____ (Head/Chair of Department)

IV. Response

Graduate College Response _____ Date _____

Copy: [] Student [] Interdepartmental Major [] Department [] Records

Important

This recommendation form must be typewritten and submitted to the Graduate College Office for approval, **and must be submitted and approved before the Program of Study will be processed.**
 Approved copies will be returned to the department(s) (as listed in item #5 and #6 below) to distribute to the DOGE, major professor, and the student.

1. Student's Name: _____
Last First Middle

2. SS#: _____ 3. E-mail: _____

I. Student Degree Information	
4. Degree Sought: <i>(Indicate 2nd degree only if in a double-degree program)</i>	
5. Department	6. Co-Department (if any)
7. Major	8. Co-Major (if any)
9. Area of Specialization (if any)	10. Co-Area of Specialization (if any)
11. Minor Department(s) (if any)	12. Minor(s) (if any)

II. Committee Member Information					
Code No.*		Name (Typed and Signed)	Major or Program <i>(Abbreviation)</i>	Department <i>(Abbreviation)</i>	Office Use Only

*Codes: 1 = Major Professor/Co-Major Professor
 2 = Minor Representative
 3 = Committee Member
 4 = **Non-member of the Graduate Faculty (MEMO REQUIRED)**

Committee appointment form will be **returned** without a memo.

Comments:

III. Signatures		
(OFFICE USE ONLY)	Student	Date
	Director of Graduate Education (DOGE) for Major	Date
	DOGE for Co-Major (if any)	Date
	DOGE for Interdept. Major or Minor (if any)	Date
Month and Year		

Copy _____ Department _____ Major _____ Major Professor _____ Student _____ Co-major _____ Minor _____

Master's POS Committee The master's POS committee consists of at least three members of the graduate faculty. It must include two members, including the major professor, from inside the major or program. One member of the committee must be from outside the major or program. A term member of the graduate faculty may participate in the direction of a student's master's research if a member of the graduate faculty serves as a co-major professor.

Doctoral POS Committee The POS committee for a doctoral program consists of at least five members of the graduate faculty. It must include at least three members, including the major professor, from within the student's major or program. At least one member of the Ph.D. POS committee must be outside the student's major or program. A term member of the graduate faculty may participate in the direction of a student's dissertation research if a member of the graduate faculty serves as a co-major professor.

The Major Professor The major professor, who must be a member of the graduate faculty in the student's declared major, serves as chair of the POS committee. If a major professor resigns or retires, he or she may still serve as a major professor as long as another graduate faculty member is appointed to serve as a co-major professor.

Co-Major Professors A master's or doctoral degree student may have two or more major professors who serve as co-chairs of the POS committee. Co-chairs may exist in the following instances:

- When a student has a co-major, each of the major fields must be represented by either a different major professor, which will require the designation of co-major professors, or a faculty member in both majors.
- When Ph.D. work is administered through a program in which the largest share of course credits is taken, but the research is conducted in another program or major and supervised by a graduate faculty member in that program, both the dissertation supervisor and a member of the graduate faculty from the program in which the degree will be granted are designated as co-major professors.
- An approved committee for a double degree must include co-major professors from each of the programs. Only certain programs have been approved for double degrees. Students seeking double degrees must clearly note that in the "Comments" section of the "Recommendation for Committee Appointment" form.
- If a term member of the graduate faculty is chosen as major professor for a POS committee, a co-major professor who is a member of the graduate faculty also must be identified.
- When there are co-specializations in the same department, only one major professor is required.

In all cases where there are co-major professors, both must sign on all required forms to be submitted to the Graduate College.

Members of the Committee

- **Members and Term Graduate Faculty Members.** Any graduate faculty member or term graduate faculty member may serve as a member of a master's or doctoral POS committee.
- **Member(s) from Outside the Student's Major.** The outside member(s) of the POS committee provide relevant specialized knowledge or a different perspective helpful to the planning, execution, and reporting of research.
- **Member(s) from a Minor.** If a minor has been declared, a graduate faculty member from the minor program or interdepartmental minor must serve on the POS committee. The major professor and the representative from the minor field may not be the same person.
- **Retired Faculty.** Retired ISU graduate faculty members may serve as members on master's or doctoral committees as long as they are willing to participate actively.
- **Resigned Faculty.** Graduate faculty members who have resigned but are currently serving on an approved committee may continue to serve in that capacity if they are willing to participate in exams. They may not be appointed to a new committee.
- **Non-member of the Graduate Faculty.** Non-Graduate Faculty Members may serve as non-voting members of a master's or doctoral POS committee. A memo must be attached explaining why the appointment is recommended. Non-voting members are invited but not required to attend all committee functions and to sign the report form.

Exceptions to the Above Any request for an exception to the above should be in the form of an explanatory memo submitted with this Committee Appointment form for the Graduate Dean's approval.

POS Committee Changes Recommendations for changes in the POS committee for a master's or Ph.D. degree must have the written approval of the student, major professor, DOGE, and all committee members involved in the change before seeking approval of the Graduate College. The "Request to Change Committee Appointment" form is available at www.grad-college.iastate.edu/forms/forms.html or in your department. All changes must be approved by the Graduate Dean before an oral is held.

Explanatory notes:

Major Department. The department or interdepartmental program having administrative responsibility for the student and usually responsibility for his or her major. Possible exceptions to this rule are noted in the Graduate Catalog.

Major. The area of academic or professional concentration approved by the Board of Regents in which a student chooses to qualify for the awarding of a graduate degree.

Area of Specialization. A subdivision of a major in which a strong graduate level program is available. Areas of specialization formally approved by the Graduate College are included parenthetically after the name of the major on official records and transcripts.

Interdepartmental Program. An administrative unit not usually functioning as a department, usually headed by a supervisory committee, and offering a degree with major(s) in that subject area. Interdepartmental programs have been officially approved and may offer courses.

Interdepartmental Major or Minor. A course of study administered through an approved cooperating department and an interdepartmental major or minor supervisory committee. Interdepartmental executive officer approval is required on both the Committee Appointment and Program of Study forms.

Minor Department. The department or interdepartmental program having responsibility for the student's minor.

Minor. Students may declare a formal minor in any department authorized to grant a graduate degree and in departments or interdepartmental units authorized to offer a formal minor only. The student must meet the requirements established by the department administering the minor. The minor department executive officer must sign both the Committee Appointment and Program of Study forms. A doctoral student declaring a minor must pass a preliminary oral examination covering that area. Once the preliminary oral examination has been taken, a Ph.D. candidate cannot add a minor.

APPENDIX F

Program Of Study (instructions below)

Graduate College • IOWA STATE UNIVERSITY

- The Committee Appointment must be approved by the Graduate College before we can review a Program of Study (POS).
- The Program of Study form should be submitted to the Graduate College by the end of the second semester of registration.

1. Student's Name: _____ 2. University ID Number: _____
Last First Middle

I Degree Program	
3. Degree Sought: <i>(Indicate 2nd degree only if in a double-degree program)</i>	4. Degree Option: <input type="checkbox"/> without thesis <input type="checkbox"/> with thesis or dissertation
5. Department	6. Co-Department (if any)
7. Major	8. Co-Major (if any)
9. Area of Specialization (if any)	10. Co-Area of Specialization (if any)
11. Minor Department(s) (if any)	12. Minor(s) (if any)
13. Projected Examination Dates	a. Preliminary Examination: _____ a. Final Examination: _____ <i>(Master's & ...)</i>

II Planned Graduate Program

PLEASE READ THE INSTRUCTIONS BELOW (AND ON THE BACK PAGE) AND NOTE:

- No more than nine credits earned under the Nondegree option can be used toward an advanced degree.
- If transferring graduate credits from another university, a transcript must be attached. See instructions for transfer rules.
- Transfer of graduate credits taken as an ISU undergraduate senior, must be verified at 10A Alumni Hall.
- Memo is required for courses which exceed time limit. See instructions for time limit rules.

Line	University	*	Department Name	Course Number	Semester Credits	**	Course Title <i>(Abbreviate to fit on one line)</i>	Grade	Year
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									

(*) Mark transfer credits "Tr" or "U"; mark test-out credits "T" (**) Indicate if "Z" courses. Is there a second page? Yes No

OFFICE USE ONLY	ISU Courses	ISU Research	ISU Total	Tr & T, U	Total Credits	Additional Credits
Total						

III Approvals

Name—Major Professor (typed and signed)	Name—Committee Member (typed and signed)
Name—Committee Member (typed and signed)	Name—Committee Member (typed and signed)
Name—Committee Member (typed and signed)	Name—Committee Member (typed and signed)
OFFICE USE ONLY	Student's Signature _____ Date _____
	Recommended by: Major DOGE: _____ Date _____
	Recommended by Co-Major DOGE (if any): _____ Date _____
	Recommended by Minor DOGE (if any): _____ Date _____

Copy _____ Department _____ Major _____ Major Professor _____ Student _____ Co-major _____ Minor _____
 Code _____

IMPORTANT-THIS PROGRAM OF STUDY FORM MUST BE TYPEWRITTEN.**Please Note the Following:**

- Have all approved committee members review and sign the form (**an approved committee form must be on file before this POS is submitted**).
- Submit the form to the Graduate College for review, approval, and retention. **This Program of Study form should be submitted to the Graduate College by the end of the second semester in residence.**
- Approved copies will be returned to the administering department (as listed in item #5 and #6 on the POS) to distribute to the DOGE, major professor and the student.
- Courses taken as a special (nondegree undergraduate) student or used to meet undergraduate degree requirements are not acceptable for graduate credit.
- Courses graded Pass/Not Pass (P/NP) may not be listed on the Program of Study.

Part I: Degree Program

Degree Sought: Using the drop-down menu, insert the same degree as listed on the student's committee form. ["Masters" is not sufficient; cite specific degree (e.g., Master of Accounting, Master of Agriculture, Master of Arts, Master of Science., etc.)].

Degree Option: Indicate which option you will pursue.

Department, Major, and Specialization: In many cases the name of the **major(s)** (item #7 and #8) will not be the same as the name of the major **department/ program** (item #5 and #6). Indicate an official specialization if any (item # 9). Indicate the co-major or program and/or co-area of specialization of any (# 6 and #8).

Minor (items #10 and #11): List if declared. Otherwise, leave blank. In order to have a minor placed on the transcript after graduation, the minor must be approved on the Program of Study, and listed on all examination reports and on the Application for Graduation.

Examination Dates: This is only a tentative schedule that does not represent a commitment but is needed by your committee.

PART II: Planned Graduate Program**ISU Graduate Courses Taken As A Graduate Student**

- List all courses as semester credits.
- Course numbers should indicate the course as it appears or will appear on the transcript.
- Complete the grade and year columns for all courses you have already taken.
- Estimate a year for courses to be taken in the future.
- Specify **minimum** number of research credits required.
- Courses taken as a graduate student that are NOT graduate credit may be shown on the POS but **must** be marked "Z" in the ** column. They will not count towards your total credits, but can appear for information purposes.
- If more space is needed, check the "second page" box at the end of **PART II** and complete the supplemental POS page.

ISU Graduate Courses Taken as an ISU Undergraduate Senior

- Mark "U" in the single * column.
- Obtain a certification letter by email from 10A Alumni Hall (Graduation section of the Registrar's Office) and attach to POS.
- Courses must be graduate level with a grade of "B" or better. The grades will not appear on the graduate transcript.
- Courses cannot be used for an undergraduate degree, nor be taken as a special student.

Graduate Courses Taken at Another University

- Indicate University name.
- Mark "TR" in the single * column.
- Have a transcript attached to the POS which states that:
 - Courses were taken as a graduate student.
 - Courses were graduate level.
 - A grade of "B" or better was received.
 - "P" or "S" grades are **NOT ACCEPTABLE** for transfer credits.
- If the POS committee recommends transfer of research credits with "P" or "S" grades, it is responsible for ascertaining if the grade was "B" or better, by letter from the responsible faculty member at the other university.
- **COURSES TAKEN AS AN UNDERGRADUATE AT ANOTHER COLLEGE OR UNIVERSITY MAY NOT BE INCLUDED ON YOUR ISU POS.**

Time Limits

- Work for the master's degree should be completed within 5 years. Work for the doctorate should be completed within 7 years. Exceptions to these rules should be addressed in a memo attached to the POS as specified in the *Graduate Student Handbook*.

PART III: Approvals

Obtain signatures indicated.

APPENDIX G

Program of Study (Supplement)

Graduate College • IOWA STATE UNIVERSITY

1. Student's Name: _____

2. Social Security Number: _____

II Planned Graduate Program (continued)									
Line	University	*	Department Name	Course Number	Semester Credits	**	Course Title	Grade	Year
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
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36									
37									
38									
39									
40									
41									
42									
43									
44									
45									
46									
47									
48									
49									
50									

(*) Mark transfer credits "Tr" or "U"; mark test-out credits "T" (**) Indicate if "Z" courses.

- Copy
 Department
 DOGE
 Major Professor
 Student
 Co-major
 Minor
 Code

Request for Preliminary Oral Examination

For Doctor of Philosophy Candidates

Graduate College

Student's Name: Last	First	Middle	Social Security Number
Department(s)			
Major(s)			

Instructions for Student

- Set the date, time and place for the preliminary oral examination with your POS committee members.
- Type or print clearly on this form.
- Submit all 4 copies of this form to the Graduate College Office **AT LEAST TWO WEEKS BEFORE** the date of the preliminary oral examination and **AFTER** checking that the following conditions have been met:
 1. Full admission status as a Ph.D. candidate.
 2. "Recommendation for Committee Appointment" form approved by the Graduate College.
 3. "Program of Study" form approved by the Graduate College.
 4. English examination requirement met.
 5. Not on probation.
 6. Time limit not exceeded for coursework.
 7. Departmental examination (if any) passed.
 8. Registration for **AT LEAST THE EQUIVALENT OF TWO CREDIT HOURS** during the term in which the preliminary oral examination is taken.

Planned Schedule for the Preliminary Oral Examination

Date	Time	Place
Requested by Major Professor(s) (typed or printed & signed)		Date
Requested by Director(s) of Graduate Education for the Major(s) (typed or printed & signed)		Date

PLEASE NOTIFY THE GRADUATE COLLEGE IF THE EXAMINATION IS NOT HELD AS SCHEDULED

Graduate College Action

Request Approved	Date
Request Denied	Date
Comments or Conditions:	

After the Graduate College's Approval

Upon approval of this request, the Graduate College will send the Graduate Department Secretary; (1) the "Report of Preliminary Oral Examination" form for reporting the examination result, (2) three copies of the approved "Request for Preliminary Oral Examination" form to be distributed as indicated on the bottom of the form. **ALL COMMITTEE MEMBERS ARE REQUIRED TO ATTEND THE PRELIMINARY ORAL EXAMINATION AND SIGN THE REPORT FORM.**

APPENDIX I

IGERT TRAINEE REQUIREMENTS CHECKLIST

Name: _____ Committee members and departments: _____
ISU entry date: _____ 1. Major prof: _____, _____
Major: _____ 2. Co-major prof: _____, _____
Home dept: _____ 3. Member: _____, _____
Co-major: _____ 4. Member: _____, _____
Minor: _____ 5. Member: _____, _____

Degree Requirements and Training Activities

Research Exploration Rotations: Indicate labs and rotation dates (3 required)

1. Lab: _____ from: _____ to: _____
2. Lab: _____ from: _____ to: _____
3. Lab: _____ from: _____ to: _____

In each blank below, indicate the date (mm/dd/yy) or semester and year the requirement was met.

Joined laboratory of major professor _____

Committee Appointment form approved (date filed _____)

NOTE: This form must be filed by the end of the first year of study.

1st POS Meeting: Program of Study (POS) and Research Plan approved by the POS Committee

(date filed _____) NOTE: This should be approved by 1st semester of 2nd year.

Teaching (Teaching Assistantship or Teaching Seminar) indicate courses taught or attended

Internship: [] Academic [] Industrial Location: _____

International Research Experience: Location: _____

Preliminary exam (Ph.D. only)

This should be taken by first semester of third year. The preliminary examination must include a written component in the form of a research proposal

Final examination passed

Thesis title: _____

IGERT Course and Training Requirements

Required Core Courses

Semester/Year	Grade	
		GDCB 511 Molecular Genetics, 3 cr (or equivalent) AND BCB 567 Fundamentals of Genome Informatics, 3 cr OR BCB 568 Advanced Genome Informatics, 3 cr OR BCB 569 Structural Genome Informatics, 3 cr OR BCB 570 Computational Functional Genomics and Systems Biology, 3 cr

Required Seminars and Activities

Semester/Year	Grade	
		BCB 593 Workshop, 1 cr (at least 2)
		BCB 690 Student Seminar, 1 cr (Spring) (at least 2; 2 oral presentations required)
		<input type="checkbox"/> Title of oral presentation _____
		<input type="checkbox"/> Title of oral presentation _____
		<input type="checkbox"/> Title of oral presentation _____
		BCB 691 Faculty Seminar, 1 cr (Fall) (at least 1 required)
		Scientific Ethics Workshop, no cr (during Fall Orientation)
		<p>Bioethics Training: BCB students are required to take BCB-approved bioethics courses or course modules. M.S. students are required to take at least one BCB-approved bioethics course/module (0.5 credit minimum). Ph.D. students are required to take at least two bioethics modules or another BCB-approved bioethics course (1 credit minimum). The required sessions in general scientific ethics offered during Fall orientation (above) do not count toward this bioethics course requirement. Students supported by special training grants may have additional bioethics training requirements.</p>
		Agron/Gen/PIP 565A Professional Practices in Research, .5 cr, S
		Agron/Gen/PIP 565B Intellectual Property and Industry Interactions, .5 cr, S

Annual Joint Bioinformatics Symposia: Iowa State and New Mexico State conduct annual joint symposia in which IGERT trainees are required to participate at least twice during the course of graduate training.

Month/Year attended	Topic

Comments and Clarifications

Describe course waivers, transfers, etc. Where appropriate, include date of action and attach memo of explanation.

Additional Information

When listing publications and presentations, please use the citation format as noted.

Published journal articles:

Authors [last name, then initials for first and middle name]. (Year in parentheses). Article title [capitalize only first word, word after colon and proper nouns]. *Publication name* [in italics, with capitals where usually used]. Volume number(issue number):pages.

Conference publications:

Authors, paper title, conference name, year, pages.

Conference presentations:

Authors, presentation title, conference name, date, city, state, country, organization.

Other (books, book chapters, patents applied for or awarded):

Publications and manuscripts in preparation:

Authors, title, publications to which the paper has been or is expected to be submitted.

Signatures

Student (sign)

Date

Major professor signature (type or print, and sign)

Date

Co-major professor signature (type or print, and sign)

Date