

The Individual Development Plan for Graduate Students at Rutgers University

This Individual Development Plans (IDPs) helps address two needs. First, it provides a structure to systematically identify training needs and competencies, establish goals and take stock of year-by-year progress during your PhD years. Thus, IDPs help graduate students stay on track with their research, paper and grant writing and skill development. Second, there are many career options for people who have obtained a PhD in the biological sciences. The IDP helps you plan and prepare for your post-PhD future while you are in graduate school. In both these areas, IDPs can serve as a tool to facilitate communication between trainees and their mentors. A Sigma Xi survey showed that trainees with a structured plan are more satisfied, more productive and have fewer conflicts with their PI.

Goals and Benefits

An annual IDP can be one component of a broader mentoring program. Specifically, it helps you as a graduate student:

- Establish target dates for academic and research milestones;
- Set goals and sub-goals for the next year, including how to spend your time; and
- Define in detail the approach you plan to take in order to obtain the specific skills and strengths needed (e.g., courses, technical skills, teaching, supervision) along with an anticipated time frame for obtaining those skills and strengths.
- Help define career goals and create annual plans to reach your goals;
- Provide a tool that can be used to provide structure for conversations between the you and your mentor.

Outline of the IDP Process

The development, implementation and revision of the IDP require a series of steps to be conducted by you, and then discussed with your mentor and an IDP committee. These steps are an interactive effort, and ideally both you and your mentor will fully participate in the process.

- **All documents must be submitted to the Rutgers IDP Sakai site.**
- **Every year**, you must submit to your current CV in .docx format (see page 12 for template).
- In the **first** year of graduate school, this document should be read (pages 1-5) and the **AAAS IDP** should be completed: <http://myidp.sciencecareers.org/>
- At the end of the **second** year of graduate school, **this form** (pages 6-12) should be completed and there should be a **meeting** of the student, PI, and representative of the graduate school (ask the GSBS office for a representative).
- At the end of the **third** year of graduate school, the **AAAS IDP** should be revised: <http://myidp.sciencecareers.org/>
- At the end of the **fourth** year of graduate school, **this form** (pages 6-12) should be completed and there should be a **meeting** of the student, PI, representative of the graduate school, and a professional from your projected career of interest (ask the GSBS office for help selecting one). The student is welcome to have additional meetings as desired.

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This document is based on the UCSF IDP as well as the Kellogg School of Science and Technology at the Scripps Research Institute IDP and the AAAS IDP and acknowledges the contributions of:

- Bill Lindstaedt, Director, UCSF Office of Career and Professional Development
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Annual Goals: Years 1 and 2

Goals and Responsibilities: The first two years of graduate school are critical for mastering the discipline, knowledge and skills needed for success as a research scientist; for acquiring scientific knowledge from the classroom and by reading the primary literature; and for developing oral and written communication skills.

Learning:

- Take the courses you need to become literate at a graduate level in your broad areas of interest..
- Spend enough time and effort on your coursework in order to learn what you need to know so you have a specialized background.
- Read primary literature and reviews.
- Learn about new developments and emerging knowledge in your fields of interest and research.
- Attend seminars within and outside your area of focus to broaden and deepen your scientific knowledge base.
- Determine the laboratory and/or computational skills you are likely to need.

Choosing a lab and thesis project:

Year 1

- Select laboratory rotations that will provide you with the basis to choose a thesis area.
- Spend enough time and effort in the lab to gain a good sense of your lab choices and to provide potential mentors with a positive view of your abilities and attitudes.
- Determine who you want to be your thesis mentor (by end of year 1).

Year 2

- Define your thesis project.
- Decide when to take your oral/propositional qualifying exam.
- Determine who will be on your thesis advisory committee.

Scientific research skills:

- Learn to design an experiment to address a scientific question that would generate a conclusive answer from the results.
- Learn to plan and execute an experiment and record the results in a form that could be published.
- Begin to interpret your results and assimilate new knowledge to formulate good scientific questions.

Participation in the scientific community:

- Understand the standards of professional and ethical scientific conduct and be committed to upholding them.
- Form appropriate support relationships with mentors, peers, and administrative staff.

Communication skills:

- Learn to organize, interpret and present your research results using the appropriate graphics and text.
- Learn to communicate your research results effectively in an oral and visual presentation to your colleagues and to a general audience.
- Learn to communicate scientific concepts effectively through writing.
- Decide what fellowships to apply for and learn when the deadlines are.
- Learn who are key contacts, in addition to your PI, for editing and helping you think through ideas.

Career development:

- Begin to learn about various career opportunities for those with a PhD in science.
- Establish a clear set of goals that you wish to accomplish this year and next.
- Discuss these goals with your mentor/ IDP committee members.

Annual Goals: Year 3

Goals and Responsibilities: The third year of graduate school is the first year entirely dedicated to research in the laboratory. As a member of a team, your role is to expand your interest far beyond the bench in order to: build multi-tasking skills; further your academic knowledge; expand your network through collaboration and technical interactions; improve upon your written and oral communication skills; and become an independent scientist. The third year is the pivotal point to grasp the entirety of what a good scientist must consider and do to be successful. Your sense of belonging to the scientific community should develop. Your longer-term goals should emerge in order to make appropriate decisions with respect to scientific projects. You should also think about what career path matches your interests and goals, whether it be research, teaching, business, marketing, law, public policy, clinical research, science writing, etc....

Learning:

- Read the literature to become an expert in your field.
- Obtain knowledge that will broaden the scope of your work.
- Learn how to stay abreast with novelty in science.
- Attend an appropriate number of seminars.
- Learn to be critical of the literature and what you hear in a seminar.
- Begin to become an expert in your area of research.
- Learn to balance lab work efficiently with time spent reading literature.
- Improve your multi-tasking skills.

Scientific research skills:

- Learn to refine your research project and become more focused.
- Learn how to improve your experimental design.
- Learn to think creatively, troubleshoot your own experiments, and develop your scientific independence.
- Learn to efficiently translate results into publication quality data.
- Decide how far you are from your 1st publication or conference presentation.

Participation in the scientific community:

- Develop an understanding of the overall philosophy of research/the scientific method.
- Determine how you can improve your relationships with mentors, peers, and other scientists.

Communication skills:

- Solicit feedback from mentors and peers about your presentation skills and strengthen your skills.
- Present your work at and/or attend a scientific meeting and begin to network.
- Apply for fellowships.
- Write an abstract, research paper or review article.
- Learn how to improve your writing.
- Seek opportunities to practice your teaching skills.

Career development:

- Begin to explore different career choices by going to meetings, career fairs and networking.
- Continue to define your specific interests and objectives for your Ph.D. studies.
- Seek opportunities for community service and outreach.
- Evaluate your strengths and weaknesses and make adjustments to your program to improve on or accommodate them.
- Develop a focused set of goals that will lead to publication of a paper and development of your thesis within the next year.
- Discuss these goals with your mentor and thesis committee.

Annual Goals: Year 4

Goals and Responsibilities: As a fourth year graduate student you should be focused on your research, on writing papers and communicating your findings. By now, you should have acquired considerable expertise in your chosen field and you should be exhibiting this expertise through more effective planning and implementation of experiments, through mentoring newer lab members and through discussions with others in your scientific community. By the end of the fourth year, your thesis project should be nearing completion, or at the very least, you should have a detailed thesis outline and attainable set of objectives for completion. You should be able to critically read the literature, identify important new problems, develop hypotheses and design experiments to test them as an independent scientist. Finally, you should begin preparing for the career path you have chosen by working on skills required for success in that environment, whether it be research, teaching, business, marketing, law, public policy, clinical research, science writing etc....

Learning:

- Establish and demonstrate expertise in your chosen area of study.
- Stay abreast of the current literature in your field.
- Read the literature critically and identify assumptions, important implications and/or alternate interpretations.
- Increase your depth and breadth by attending seminars within and outside of your field.
- Decide if you can ask important questions and are developing good scientific taste and judgment.
- Learn to make connections between your research and the literature.
- Learn to develop new hypotheses and design experiments to test them.
- Develop a sense of where the field is going and what the next big question is.
- Determine if you are willing to learn new techniques and to take risks.
- Learn to write an original and competitive research proposal.

Scientific research skills:

- Improve your ability to interpret your data, question your assumptions and identify important implications of your findings.
- Ask important questions and design your own experiments to generate answers.
- Work with sufficient focus and intensity to drive discovery and complete your research objectives.
- Determine if you are managing your time for experiments, reading, and writing; seek help if time management is an issue..
- Develop and follow through on your own ideas.
- Seek you mentor's input on whether you demonstrate creativity and innovation in your experimental work.
- Publish a paper or prepare a manuscript for publication.

Participation in the scientific community:

- Reflect on if you are developing confidence as a member of the scientific community.
- Determine if you ask questions and enter into discussions in seminars, conferences and journal clubs.
- Develop and practice a short narrative to articulate what you have discovered and why it is important.
- Solicit feedback on whether you can deliver an effective seminar and get input from peers and mentors to improve your seminar.
- Seek out and take advantage of opportunities to present your research.
- Learn to present your research results authoritatively.
- Attend local and national meetings to present your results and network.
- Seek opportunities to improve your teaching skills.
- Develop skills in leading and motivating others, and conflict resolution by mentoring others.

Career development:

- Generate a clear plan for completing your PhD thesis research.
- Determine if you are developing an original research proposal and if you understand the criteria for assessment.
- Think about your next career stage and what the best career fit is for you having evaluated your strengths, weaknesses and passions.
- Determine the skills required for success in your chosen career path and take steps to improve your skills
- Network with people who are in the field you have chosen.
- Seek opportunities to mentor other students.
- Develop your leadership and management skills.
- Continue to be involved in community service and outreach.
- Discuss your timetable for completion and career plans with your mentor(s) and IDP committee.

Annual Goals: Years 5/6

Goals and Responsibilities: In the fifth year you should be focused on completing your experimental work and writing research papers. Ideally you should be thinking about your thesis and making plans for a post-graduate position as the next step in your career. As a fifth year student, you should have your thesis plans, and a chapter-by-chapter outline of your thesis, approved by your thesis committee. You will be expected to be an expert in your specific field of research, have command of the literature, and articulate how your research contributions complement those of other laboratories. By the end of the fifth year it is expected that you will have defended your thesis, or will at a minimum have a clear timeline for finishing and defending your thesis.

Learning:

- Demonstrate that you are an expert in your field.
- Present and defend your work with confidence.
- Articulate how your work contributes to the knowledge in your field.
- Demonstrate that you have a breadth of knowledge in areas related to your area of research expertise.
- Balance bench work with writing papers and finalizing your thesis.

Scientific research skills:

- Define a clear path and timetable for completion and publication of your thesis research.
- Identify experiments necessary for writing up the results for publication and a final thesis.
- Design experiments independently, interpret your results and determine next steps.
- Determine if you think creatively about the implications of your research to other work in the field.
- Publish any research papers and determine if they will be chapters of your thesis.

Participation in the scientific community:

- Determine if you can confidently discuss the current literature in your area of expertise.
- Attend seminars, conferences and journal clubs and actively participate with questions and comments..
- Maintain good communications with mentors, peers and administrative staff.
- Communicate with your thesis committee about finalizing your research and defending your thesis.

Communication skills:

- Present your research in local, national, and international meetings.
- Prepare and practice your thesis seminar to be understood by your thesis committee and a diverse scientific audience.
- Demonstrate writing skills through publication of your research or writing chapters of your thesis.
- Develop your management skills by learning how to manage a budget, organize and oversee a project.

Career development:

- Make plans for the next stage in your career, continue to network with people on that career path and obtain the skills necessary to be successful in your chosen career.
- Identify people who you might be interested in working with for your next phase and initiate contact with those individuals.
- Continue to mentor other students, developing your interpersonal skills and the ability to lead and motivate others including resolving conflicts.
- Continue to develop your leadership and management skills.
- Create a well-organized thesis plan.
- In consultation with your thesis committee, set a thesis defense date.

Individual Development Plan (IDP):

- **All documents must be submitted to the Rutgers IDP Sakai site.**
- **Every year**, you must submit your current CV (see page 12 for template).
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- At the end of the **third** year of graduate school, the **AAAS IDP** should be revised: <http://myidp.sciencecareers.org/>
- At the end of the **fourth** year of graduate school, **this form** (pages 6-12) should be completed and there should be a **meeting** of the student, PI, representative of the graduate school, and a professional from your projected career of interest (ask the GSBS office for help selecting one). The student is welcome to have additional meetings as desired.

Name: _____ Year in Graduate School: _____ Today's Date: _____

Part 1: State your career goals and evaluate your progress during the past year.

Primary mentor: _____

Thesis committee members: _____

IDP committee members: _____

How many years have you been in graduate school? _____

For students in their 4th - 6th years only, what month and year do you hope to finish your graduate degree? _____

What is your "Long Term Career Goal" (academic, industry, teaching, business, marketing, law, public policy, clinical research, science writing etc...)? Why have you made that decision and what skills do you have that you think will allow you to succeed in that career?

What is your "Next Step Career Goal" (postdoctoral training, job, internship etc)? Why have you chosen this as your next step and how will it help you achieve your long term goal?

If your career goals have changed in the past year list why:

Provide a brief overview of your research project and major accomplishments in the past year:

What were your main goals for the past year?

Which goals did you meet? If you did not meet a goal, why not?

New areas of research or technical expertise acquired in the past year:

Publications:

Fellowships applied for:

Local and national meetings attended (indicate meeting title, oral or poster presentation):

Oral presentations (indicate date and venue):

Teaching activities:

Other professional activities, including those that have helped you explore different career options:

Community/service activities, including participation on graduate student committees, volunteer work and science outreach programs in the community:

Part 2: Skills Assessment

SELF Evaluation: Assess your strengths, weaknesses and skills

Evaluate your skills and abilities in the following areas where:

5 = Highly proficient

1 = Needs improvement

Overall Core Scientific Knowledge		1	2	3	4	5
	Knowledge of literature in the field	1	2	3	4	5
	Knowledge of literature related to project	1	2	3	4	5
	Knowledge area:	1	2	3	4	5
	Knowledge area:	1	2	3	4	5
Laboratory or Bench Skills (eg, microscopy, animal skills):						
	Skill set (specify):	1	2	3	4	5
	Skill set (specify):	1	2	3	4	5
	Skill set (specify):	1	2	3	4	5
	Efficiency and speed	1	2	3	4	5
	Other:	1	2	3	4	5
General Research Skills (eg, designing experiments, creativity):						
	Designing experiments	1	2	3	4	5
	Analytical skills	1	2	3	4	5
	Problem solving/troubleshooting	1	2	3	4	5
	Creativity/developing new research directions	1	2	3	4	5
	Independence	1	2	3	4	5
Professional Skills:						
	Oral presentation skills	1	2	3	4	5
	Grant writing skills	1	2	3	4	5
	Manuscript writing skills	1	2	3	4	5
	General scientific writing skills	1	2	3	4	5
	Teaching skills	1	2	3	4	5
	Mentoring others	1	2	3	4	5
	Being mentored	1	2	3	4	5
	Other:	1	2	3	4	5
Leadership and Management Skills:						
	Leading and motivating others	1	2	3	4	5
	Budgeting	1	2	3	4	5
	Managing projects and time	1	2	3	4	5
	Organizational skills	1	2	3	4	5
Interpersonal Skills:						
	Getting along with others	1	2	3	4	5
	Communicating clearly in writing	1	2	3	4	5
	Communicating clearly in conversation	1	2	3	4	5
	Conflict resolution	1	2	3	4	5
	Networking/meeting new colleagues	1	2	3	4	5
	Other:	1	2	3	4	5

MENTOR Evaluation:

Ask your mentor or other trusted colleague to assess your strengths, weaknesses and skills, and then return the list to you for discussion. Evaluation from last year can be provided to assess progress.

Please evaluate the skills and abilities of _____ in the following areas, where:

5 = Highly proficient

1 = Needs improvement

Overall Core Scientific Knowledge		1	2	3	4	5
	Knowledge of literature in the field	1	2	3	4	5
	Knowledge of literature related to project	1	2	3	4	5
	Knowledge area:	1	2	3	4	5
	Knowledge area:	1	2	3	4	5
Laboratory or Bench Skills (eg, microscopy, animal skills):						
	Skill set:	1	2	3	4	5
	Skill set:	1	2	3	4	5
	Skill set:	1	2	3	4	5
	Efficiency and speed	1	2	3	4	5
	Other:	1	2	3	4	5
General Research Skills (eg, designing experiments, creativity):						
	Designing experiments	1	2	3	4	5
	Analytical skills	1	2	3	4	5
	Problem solving/troubleshooting	1	2	3	4	5
	Creativity/developing new research directions	1	2	3	4	5
	Independence	1	2	3	4	5
Professional Skills:						
	Oral presentation skills	1	2	3	4	5
	Grant writing skills	1	2	3	4	5
	Manuscript writing skills	1	2	3	4	5
	General scientific writing skills	1	2	3	4	5
	Teaching skills	1	2	3	4	5
	Mentoring others	1	2	3	4	5
	Being mentored	1	2	3	4	5
	Other:	1	2	3	4	5
Leadership and Management Skills:						
	Leading and motivating others	1	2	3	4	5
	Budgeting	1	2	3	4	5
	Managing projects and time	1	2	3	4	5
	Organizational skills	1	2	3	4	5
	Other:	1	2	3	4	5
Interpersonal Skills:						
	Getting along with others	1	2	3	4	5
	Communicating clearly in writing	1	2	3	4	5
	Communicating clearly in conversation	1	2	3	4	5
	Conflict resolution	1	2	3	4	5
	Networking/meeting new colleagues	1	2	3	4	5
	Other:	1	2	3	4	5

Part 3: Set goals and learning objectives for the next year.

In the “Setting Goals” sections, you will set goals for developing your skills and accomplishing your projects during the coming year and achieving scientific independence.

Setting Goals: Research Projects

Scientific question: What are the **scientific questions** that you will be working towards answering in the next year? These may be individual papers (or figures within a single paper) that you aim to publish. Connect w/ bigger picture in field.

Experimental approach: What are the experimental approaches that you are currently pursuing? Are there other approaches that you could try? Are there additional more promising experiments that you should be doing?

Setting Goals: Scientific Knowledge

Knowledge area: In what areas do you want to acquire more **scientific knowledge**?

Method for knowledge development: Do you plan to do more *reading* in this area? *Discuss* with specialists? Attend *conferences*?

Setting Goals: Research/Laboratory Skills

Skills Area: What further **research-related or laboratory skills** do you need to acquire to be successful in this step of your career and in the next step? (See the Skills Assessment Worksheet in Part 2.)

Method for skill development: How will you gain exposure to those skills?

Setting Goals: Oral Presentation Projects and Skills

Presentation Projects: What talks and posters do you plan to present in the next year? (at lab meetings, journal clubs, in-house seminars and scientific meetings)

Presentation Skills: Are there specific presentation skills you would like to work on in the coming year?

Method for skill development: What will you do to develop these skills? (attend professional development workshops, volunteer to give more presentations, attain feedback from mentors and peers)

Setting Goals: Writing Projects and Skills

Writing Projects: Are there any writing projects that you will be continuing or initiating this year? (fellowships, manuscripts, grants)

Writing Skills: Are there specific writing skills you would like to work on in the coming year?

Method for skill development: What will you do to develop these skills? (writing workshops, practice writing projects, seek editing assistance)

Setting Goals: Leadership, Interpersonal, and Communication Skills

Leadership, management, and interpersonal skills area: What specific skills do you need to acquire or improve? What specific skills will you work on in the coming year? (See Part 2 of this IDP for examples.)

Method for skill development: How will you work to develop these skills? (examples: attend workshops/seminars, seek advice of mentors/colleagues or advisors/counselors, ask to lead meetings and seek feedback, seek leadership positions on your campus or in a professional society.)

Setting Goals: Career Development Projects

Career Development Projects: List activities that you will complete during the next year to learn more about and move closer to your major career goal (attend workshops, advice from counselors, conduct informational interviews with people in your desired career path, read/research potential career paths, take classes that enhance your skill set in areas related to your long term career goals). See this site for a list of resources at Rutgers: http://rwjms.rutgers.edu/education/gsbs/student_affairs/career.html

Time management:

How much of your time do you plan to spend on each of these goals and activities? What will your effort distribution be?

Part 4: Implement Your IDP

Writing your IDP is just the beginning of the career development process and serves as the road map. Now take action!

Meet and discuss: At the end of the **second** year of graduate school, there should be a meeting of the student, PI, and representative of the graduate school (ask the GSBS office for a representative). At the end of the **fourth** year of graduate school, there should be a meeting of the student, PI, representative of the graduate school, and a professional from your projected career of interest (ask the GSBS office for help selecting one). Additional meetings are welcome if desired.

Put your plan into action: Read it over regularly to check your progress.

Revise and modify the plan as necessary: The plan is not cast in concrete; it will need to be modified as circumstances and goals change. The challenge of implementation is to remain flexible and open to change.

Update your CV using the following format and submit it annually to Rutgers IDP site

NAME
EMAIL:
PHONE:

PRESENT ADDRESS

Street Address
Town, State, Zip Code

PERMANENT ADDRESS

Street Address
Town, State, Zip Code

CITIZENSHIP
EDUCATION

UNDERGRADUATE

University name and location
Degree, Major, Month and Year of Graduation
If you attended other institutions, list in reverse chronological order and use either dates of attendance or graduation date.

GRADUATE

University name and location
Degree, Program, Month and Year of Graduation or Expected date
If you attended other institutions, list in reverse chronological order and use either dates of attendance or graduation date.

RESEARCH EXPERIENCE

Graduate: Title of thesis, advisor, dates
Undergraduate or technician experience: Topic of research, mentor, dates
Internships: Organization, topic of research, dates

EMPLOYMENT

Employment not listed under research experience

PROFESSIONAL ORGANIZATIONS

Membership in scientific societies, dates

HONORS AND AWARDS

Name of award and description if not clear, date

TEACHING EXPERIENCE

School, course title, role, dates

FELLOWSHIPS AND GRANTS

Granting agency, title of project, amount of award, dates

PUBLICATIONS (list in reverse chronological order)

REFEREED

Include papers published, in press, submitted, or in preparation

REVIEWS OR CHAPTERS IN BOOKS

ABSTRACTS

PATENTS

PRESENTATIONS

Title of talk or poster at meetings or symposia, all authors, meeting name, date, location

ACTIVITIES AND SERVICE

Membership and leadership within organizations: Title (Treasurer, Special Events Committee Chair, etc.), name of the organization, dates.

NOTE: Only if applying for job at pharmaceutical or biotech company include **OBJECTIVE** at top, and **SKILLS** and **LIST OF REFERENCES** at end.