Appendix 2. Research activities by work position in the research lifecycle

	Idea generation ==>		Funding ==>		Experiment/Analysis ==>		Research product ==>		Evaluation	
Actor	PIs	Junior staff	PIs	Junior staff	PIs	Junior staff	PIs	Junior staff	PIs	Junior staff
Community	laboratory, science community, invisible college	laboratory, loose personal connections, lab equipment company	personal connections in and outside the institutions, funders	laboratory	lab staff, co-work team	laboratory, virtual community (e.g., BRIC)	academic society, publishers, patents, publishing community, peer review	academic society, publishers, patents, publishing community, peer review	funding agency, national funding programs	academic and research institutions
Object / Outcome	generate creative ideas, get into inner circle of big government project	get relevant project assignment from PI, locating equipment, successful feasibility test	secure grants, make research collaboration team	preparing for proposal writing	successful completion of experiment, Producing meaningful analysis and interpretations	find effective test procedures, successful experiments, sense-making to experimental results	source technology, patent, publications in journals of broad readership	publish in high impact journals	promotion, good internal evaluation, acquire future funding	publications, earning degrees, graduation, jobs, promotions
Division of Labor/ Roles	monitor latest trends in grants and research, Leads lab meeting, identify the labs owning necessary equipment and making contacts with them	get relevant project assignment from PI, feasibility test,Post Doctoral fellow, draw roadmap based on the PI's idea, literature, locate lab equipment, share ideas with PI at the lab meeting	identify funding sources,Write grant proposals, make a trusful research collaboration team using personal networks, obtain insider's information, invest efforts to get into the inner circle of the leading research group	prepare the draft of grant proposals for PI	presides over lab meeting, time management, decision makings in the process of experiment, maintain trustful relationship with collaborators, obtain lab equipment access	* **Post Doctoral fellow**: conduct experiment, play middle manager role //**Graduate Student:** repeat trials and error for successful experiment, summarize experimental results to write papers, keep records in laboratory notes	submit final report to the funding agency, patent application,Select journals to submit papers,submit paper, technology transfer, industralization	summarize research finidngs, update with latest research, write first draft, write papers in English	evaluation of funding agency, internal evaluation, evaluation of the funding system, affecting the next funding, receive evaluation	increase productivity to promote to a PI student, earn academic degrees
Rules / Norms	inner circle,idea exchange at conferences, lead lab meetings, get skinny information to get big government grant	support PIs, attend lab meetings,	grant information, trust	collect preliminary information to write proposals	lab meetings, make efforts to get continuous funding, time management		decide on authorship and on journals to submit	summarize findings, create images and figures	efforts to get continuous funding	publish in high impact journals
Research Tools / information sources	literature, colleagues, networking at conferences, funder websites, invisible colleage, students, lab meeting, patent DB	colleagues, boss, CNS journals, key journals, key databases (PubMed, SciFinder etc.), BRIC	RSS services and emails from Office of Research, Natoinal Research Foundations and their websites, invisible colleage	literatures	lab equipments, collaborators, colleagues, literature	BRIC, literature, lab senior students,colleagues, PI, experiment procedures strategie, tips, good command of hardware and software use	journals websites, patent lawyers, Web of Science, company websites, market information	Web of Science, journal homepages		job market information