

A “Quick Start Guide” for starting off in research with good habits

Some things I recommend you do/learn/etc. as early as possible in your training...

(see links or <https://bit.ly/practicalposts> for more information about each)

blog version: <https://bit.ly/quickstartscience> ; downloadable: <https://bit.ly/quickstartresearch>

Things to install and/or set up:

- A **reference manager** (Zotero, Mendeley, EndNote, etc.) and its associated browser and word processor extensions
 - <http://bit.ly/referencemanagementtools>; YouTube: <https://youtu.be/p2G0LZThsfA>
- **Article alerts** (PubMed, Google Scholar, etc.)
 - blog form: https://bit.ly/science_alerts_RSS_feeds
- Install a **clipboard manager**: <https://youtu.be/3g1CEYxFFY>
- Install the free **unpaywall browser extension** to see if free versions of paywalled articles are available when you visit an article's page: <https://unpaywall.org/>
- Install the **PubPeer browser extension** to see if articles you visit or articles a visited article cites have been retracted or have had questions raised about them (usually, but not always, bad): <https://pubpeer.com/>
- Get an **ORCID** (a unique number attached to you so that if you change your name or share a name with something, computers and people won't get confused about what is and isn't published by you) <https://info.orcid.org/>
 - More here: <https://thebumblingbiochemist.com/365-days-of-science/orcidids/> & <https://youtu.be/C6o7k7ktyXc>
- **MyNCBI** account (will let you set up PubMed alerts, save PubMed searches, make a BioSketch (like a CV), make a formatted list of all your publications and presentations with MyBibliography) etc.
 - blog: https://bit.ly/why_MyNCBI ; YouTube: <https://youtu.be/bFGq4eubnQY>
- Set up an **RSS reader** such as NewsBlur (will collate new articles from sites you choose and/or on topics you choose so you can see them all in one place)
 - https://bit.ly/science_alerts_RSS_feeds ; YouTube: <https://youtu.be/jG3hlmJ7fRY>

Databases to get familiar with:

(there are lots more – and there are more in my [longer guide](#) – but these are the main ones I use, which will link you to other databases with more specialized information)

- **UniProt** (for protein info) <https://www.uniprot.org/>
 - blog: <https://bit.ly/uniprotprotparam> ; YouTube: <https://youtu.be/f75f6QCe1gA>
- **PDB** (for macromolecular structures) <https://www.rcsb.org/>
 - <https://bit.ly/pdbstructures> & <https://youtu.be/5wMwlsChz98>
- **NCBI nucleotide** (for nucleic acid sequences) <https://www.ncbi.nlm.nih.gov/nucleotide/>
- **PubMed, PubMed Central, and Google Scholar** (for papers)
- blog: https://bit.ly/databases_guide ; YouTube: <https://youtu.be/ZyLOWqZazgc>;
downloadable version of list, with links: <https://bit.ly/3RYWIS6>

Lab habits to start:

- Establish and stick to a consistent **file naming and organization** system
 - Include dates in file names
 - <https://youtu.be/vFg3tO5C4dQ>
 - Don't include spaces in file names
- Start spreadsheet **inventories** for your plasmids, primers, protein preps, etc.
 - see Google drive for examples
 - plasmid inventories: https://bit.ly/plasmid_inventory ; YouTube: <https://youtu.be/Zknk4zNLAQ8> ;
<https://docs.google.com/spreadsheets/d/1eMbZUuWlqO-CEYcR445ZalHUnZYg2uwq/edit?usp=sharing&oid=110501489579733284162&rtpof=true&sd=true>
 - protein inventories: https://bit.ly/protein_inventorying ; YouTube: <https://youtu.be/myoxFfKpyP8> ; here's a link to my example protein prep inventory template spreadsheet:
https://docs.google.com/spreadsheets/d/1Qys8OEK-JITD8kUvHUN0QsoBG_Gh1t3b/edit?usp=sharing&oid=110501489579733284162&rtpof=true&sd=true
- Keep good, detailed **lab notes**
 - <https://bit.ly/labnotesorganization> & <https://youtu.be/JGzSUz88S-g>
- Use spreadsheets to plan out your experiments in detail before starting
 - https://bit.ly/experiment_spreadsheets & <https://youtu.be/LsO-5VjeWsw>
 - Downloadable example templates:
 - Lab calculations: https://bit.ly/bb_labcalcspreadsheet

- Experiment template: https://bit.ly/experiment_spreadsheet_example
- PCR: https://lmu0-my.sharepoint.com/:x:/g/personal/bri_bibel_lmu_edu/EQSCIWehvdxCnCgJ-BZjc9QBFkJOEFfCQ6hK6r9c4Wy-KQ?e=0YnlCB
- Keep spreadsheet logs of your assays:
 - Example template: <https://bit.ly/assaylog>
 - YouTube: <https://youtu.be/-A1WoAY-aaE>
- Practice **pipetting** - you can pipet, then weigh drops to see how accurate (close to the true value based on density of water as ~1g/mL) and precise (close together) your drops are
 - <https://bit.ly/pipetposts> & <https://www.youtube.com/playlist?list=PLUWsCDtjESrHnImO2z2GJZRADaIFSNqt8>
- Whenever you're given a protocol, make sure you **know what's going on at each step**
 - Blog: <https://bit.ly/insidethekit> ; YouTube: <https://youtu.be/Q7oOeDvdcOE>
 - Behind the scenes of various common biochemistry and molecular biology experiments: <http://bit.ly/labtechniques>
- Pick up **practical lab tips** from others
 - Watch how others in the lab do things and find what works for you
 - Here are some of mine: https://bit.ly/lab_tricks_page

Skills to start learning:

- **Basic computer programming** - especially some simple command line and Python
 - see https://bit.ly/bb_python_tips for a starter's guide
- A **vector graphics software program** like Adobe Illustrator or InkScape (free)
 - https://bit.ly/adobe_illustrator_fundamentals & <https://youtu.be/JdVSeZajq6A> & https://drive.google.com/file/d/1C72zWcht0gmtRV45Y1p0xML4JwzFrgp/view?usp=share_link

Other things:

- **Read lots** of papers - it takes a lot of practice to get comfortable with them
 - <https://bit.ly/readingsciencearticlesadvice> & <https://youtu.be/FaheM4hBG4E>
 - blog form: https://bit.ly/strategic_reading ; YouTube: <https://youtu.be/3we4u8NkyFk>
 - Template for paper notes: <https://bit.ly/litspreadsheet>
- Get familiar with the **terminology**:
 - Biochemistry slang: <https://docs.google.com/document/d/197Ef7y1rSW7FkAL2BHYYOyQgrtWfo3lsQ7S9NPT8O10/edit>
- **Ask lots of questions** (to lab mates and/or Google)

- Get good at **Googling!** (see guide)
 - Blog: <https://bit.ly/scientificgoogling> ; YouTube: <https://youtu.be/Dd6lo3MMn54>
 - Word doc: [https://docs.google.com/document/d/1UhWoA-ED28HmRkwOMYtR8Q2EtnXXfqTI/edit?](https://docs.google.com/document/d/1UhWoA-ED28HmRkwOMYtR8Q2EtnXXfqTI/edit?usp=share_link)
 - PDF: [https://drive.google.com/file/d/1lmoN3GcKWdf9ITYA8izbqo3oGbEHs_kO/view?usp=share link](https://drive.google.com/file/d/1lmoN3GcKWdf9ITYA8izbqo3oGbEHs_kO/view?usp=share_link)
- Familiarize yourself with **resources**
 - Some of my content: <https://thebumblingbiochemist.com/lets-talk-science/resources/>
 - Some of my favorite resources: <https://bit.ly/bumblingbiochemisttoolbox>
- Build a **support system** – choose your lab carefully to find one that fits you and where you'll have support throughout your ups and downs
 - Identify friends and mentors in your lab and beyond who can provide advice in various topics (hands-on guidance at the bench, experimental brainstorming sessions, career guidance, etc.)
- **Teach others** – there's a common phrase in the lab: see one, do one, teach one. The real test of whether you've "mastered" a technique is to teach others to do it correctly!