

# 13 Useful Mobile Apps For Life Scientists

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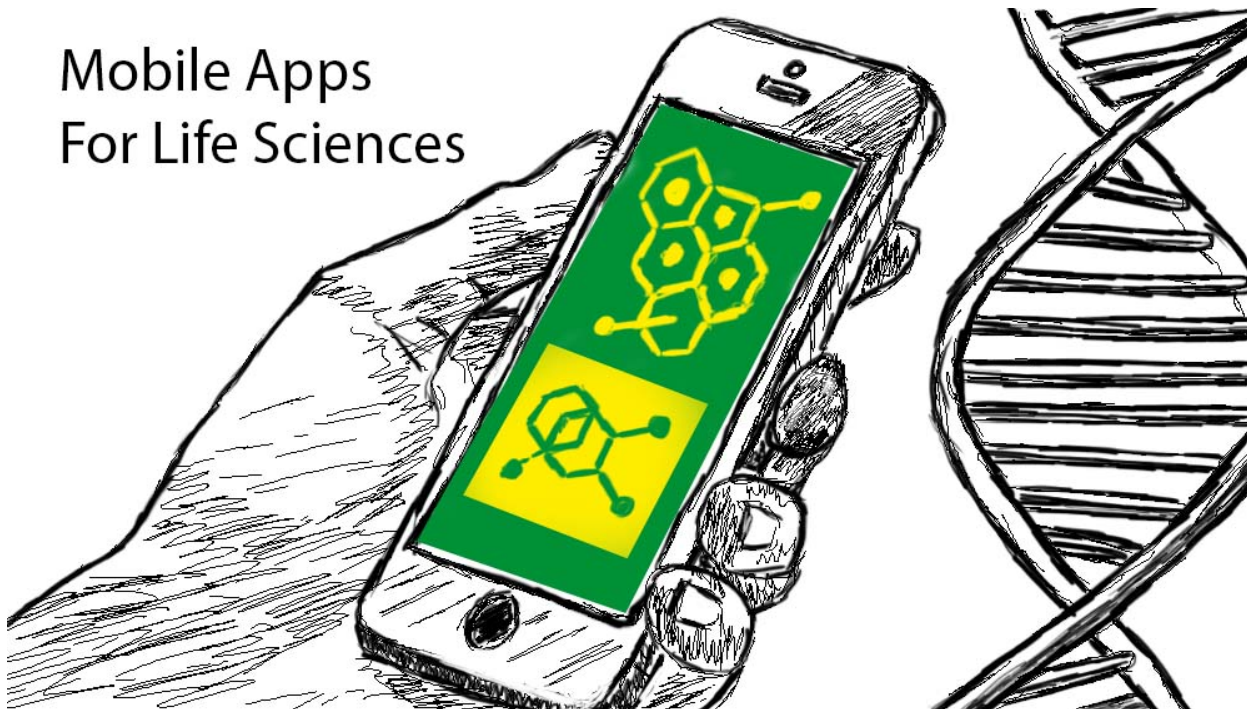
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Nowadays mobile devices are ubiquitous with an estimated number of smartphones and tablet PCs to exceed two billion globally.

The availability of internet connection in most public places, powerful processors, and user-friendly touch screen technologies make mobile devices useful not only for spare time activities but also for education and science.

Specialized mobile apps are ubiquitous in the area of healthcare providing value for medical doctors, as well as patients involved in various healthcare programs and therapies. Those include various apps for assisting clinical decision making by doctors, apps for monitoring physiological parameters of patients in real time, apps for managing doctor-patient interactions, apps for self-monitoring various health conditions and physiological parameters (for example, did you know you can identify a dangerous wart on your body using your mobile phone?) etc.

## Mobile Apps For Life Sciences



However, decent mobile apps for assisting life science researchers in their lab routine are rather scarce so far. Below I have summarized a list of 7 mobile resources which will be useful for life science professionals:

## 1. ACS Mobile

American Chemical Society mobile application for reading peer-reviewed content from ACS. Essentially, a mobile reader for accessing, reading and sharing thousands of research publications. Support powerful search functionality by keywords, author names, and other parameters.

Compatible with Android.

## 2. Approved Drugs

The Approved Drugs app summarizes over a thousand chemical structures and names of small molecule drugs approved by the US Food & Drug Administration (FDA). The app layout allows for a suitable browsing the structures and names, filtering by structural features, and ranking by similarity to a user-drawn fragment of a molecule. The detailed view allows exploring a 3D conformation as well as tautomers of the small molecules in the list.

The structures from search results can be exported in a variety of ways - to email, twitter, clipboard etc.

The Approved Drugs app is compatible with iPhone, iPad, and iPod and requires iOS 8.4 or later.

## 3. Case

Case is a machine learning (ML)-powered app that makes it easy to read medical journal articles using a smartphone, subscribe to journals and even follow more than 100.000 keywords on research and medical topics of interest. For example, you can follow topics as narrow as specific genes, biological targets, or medical drugs.

The Case app supports more than 80 medical specialities and offers a powerful recommendation engine based on Google Tensorflow. The engine ranks journal articles based on your user behavior in the past, combines with external factors, such as journal impact factor, social sharing metrics, etc.

The Case app is certainly a useful resource for both physicians and life science researchers, it has both Android and iOS versions.

## 4. Labster VR

This wonderful app opens doors into the future of scientific education - experimentation in a virtual reality laboratory. The Labster VR app for iPad will be featuring a number of different labs and experiment set-ups which can be manipulated in a usual touch screen mode or through virtual reality goggles.

Currently, there is only High-Performance Liquid Chromatography (HPLC) lab is presented in the app, where a student can analyze drug stability by comparing drugs that have been stored in different conditions. The theoretical principles and the equipment features of Liquid Chromatography are explained during the virtual experimentation.

Compatible with iPad.

## 5. Lead Designer

The Lead Designer app is a tool for medicinal chemists, which provides several useful functionalities in a mobile-friendly format, including calculation of physico-chemical parameters, 2D-molecule structure optimization, automatic ring aromatization, Cytochrome P450 3A4 binding prediction (regression QSAR model), molecule sketching etc.

The Lead Designer app requires Android 3.2 and up to run.

## 6. Medicinal Chemistry Toolkit

The Medicinal Chemistry Toolkit is a free app with a set of useful resources to support the day to day work of a medicinal chemist. The app contains tools to calculate and graphically visualize a number of values, including Cheng-Prusoff; Dose to man; Gibbs free energy to binding constant; potency shift due to plasma protein binding; Log D vs pH curves; Ligand Lipophilic Efficiency; GClogP

The App also includes a compound quality calculator, a maximum absorbable dose calculator; attrition modeller, drug-drug interactions calculator and more.

The Medicinal Chemistry Toolkit app is optimised for iPad and requires iOS 7.1 or later to run.

What is particularly interesting about this app is that it is integrated with another product - The Handbook of Medicinal Chemistry by Andrew Davis & Simon E Ward. It is a comprehensive educational e-book covering modern aspects and tools of medicinal chemistry and drug discovery. A book is interactive and it is possible to jump into the Medicinal Chemistry Toolkit to see how a described concepts actually look like in a practical example. For instance, you can play with small molecule structure to see how it affects its predicted bioactivity.

The book is for purchase and is available on iPhone, iPad, iPod touch, and Mac.

## 7. Mnova NMR

This powerful software allows analytical and organic chemists visualize, process, analyze and report 1D and 2D nuclear magnetic resonance (NMR) data and spectra. While the software is primarily suited for desktop applications on Windows/Mac/Linux platforms, it provides a user-friendly experience on tablet PCs.

The software provides a flexible way to handle data from all major magnet vendors (Agilent, Bruker, JEOL, etc) in a unified manner.

The types of data Mnova NMR can process automatically or with human assistance include  $^1\text{H}$ ,  $^{13}\text{C}$  or any other 1D NMR as well as any 2D correlations, such as HSQC, HMBC, NOESY, COSY, TOCSY, DEPTs, etc.

Mnova NMR goes with a free 45 day trial and is available under a license later.

## 8. NEB Tools App

Restriction enzymes are widely used in lab experiments for molecular cloning and DNA modification. NEB Tools app provides access to the most requested information about restriction enzymes helping plan experiments on the go.

Using this app you can find and email to your inbox restriction enzyme information selected by category, recognition sequence, or name. Also, you can determine buffer and reaction conditions for experiments with wto restriction enzymes, or calculate annealing temperature for PCR reaction etc.

The app is supported on iPhone®, iPad® or Android™ devices.

## 9. Prime: PubMed Journals & Tools

Prime is a free and powerful app which connects you to the up-to-date journal citations and abstracts from the complete PubMed database. Using this app you can search articles by keywords, author, or journal, then link to the publisher's full texts.

The Prime app also allows to bookmark articles, tag important content and search results to be able to come back to them later, and share articles from the app via Email, Dropbox and social media channels. Some additional functions include being able to discover new articles in a feed designed based on a user behaviour, and being able to set alerts for specific journals of interest -- so that you get notified when new articles are published.

What is really interesting, the app has Grapherence® tool, which allows you to visualize the influence and interrelationships among journal articles in a user-friendly graphical representation.

The app requires Android 4.4 and up.

## 10. PolyPharma

The PolyPharma provides powerful modeling and prediction tools with intuitive visualization layout for computer-aided drug design (CADD) practitioners.

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The app contains hundreds of Bayesian models for disease targets and off-targets. All the calculations are done locally, internet connection is not required.

The app features powerful graphical module able to generate colour-coded heatmaps, and structure overlays for correlating structure regions with activity or inertness.

There is a honeycomb clustering feature for interactively exploring the structure-activity neighborhood, in the context of the molecules used to build the target molecules.

PolyPharma app is compatible with iPhone, iPad, and iPod touch and requires iOS 9.2 or later.

## 11. Promega

The Promega app includes a collection of life science research tools, including BioMath, which takes care of typical laboratory calculations. With it you can do DNA and protein conversions, calculate dilutions and many other things. The app is supported by video guides and references covering key topics in molecular and cell biology.

Designed by Promega Corporation, the app features other research tools and protocols by this software developer.

Supported on iPhone, iPod Touch or iPad.

## 12. Protocolpedia

This app is a large database of laboratory protocols for research experiments across more than 15 life science categories, including Molecular biology, Cell Biology, Biochemistry, Immunology, Histology, etc, supported with step-by-step instructions and guides.

Protocolpedia app also has inbuilt calculators, such as Dilution, Molarity, Oligo Resuspension and PCR Mastermix.

Requires Android 4.4 and up to run.

## 13. Reaxys Reaction Flow

This free app is a suitable way to spend time during travel or waiting in a queue refreshing memory on named chemical reactions and their mechanisms. This educational app is made like a set of flashcards containing hundreds of well-known as well as rarely used chemical reactions, so it can be used as a learning tool and a reference.

The app is available on iPhone, iPad, and iPod Touch, it requires iOS 8.0 or later.