



Have You Considered a Career in the Analytical Instrument Field?



Ronald E. Majors, Ph.D.
ChromPrep
253 Caleb Drive
W. Chester, PA 19382 USA
ronald.e.majors@gmail.com

Do you enjoy:

- working on the leading edges of analytical chemistry?
- working with a team of equally motivated engineers and scientists?
- working on projects that make it to the market to help other analytical chemists solve problems?
- traveling to learn about new technologies in your field of interest
- discussing with end users about their needs of the future?
- working across disciplines to develop instruments or chemical products that work with the instruments?

...then you may want to consider a career in the analytical instrument and methodology field.

A Timeline of my Career in the Analytical Instrument Field

1959-1963

B.S.Chemistry (Fresno State, CA)

Education



1963-1968

Ph.D. Analytical Chemistry (Purdue U., IN)



Working Experience

1971-1987

Varian Assoc. (CA & Europe)

- LC R/D group
- European Technical specialist
- LC/GC Applic. Lab, Mgr.
- HPLC/Sample Prep. Market Dev. Mgr.
- HPLC/Sample Prep Marketing Manager
- Life Sciences Marketing Manager
- Began as monthly columnist for LCGC (1984)



1968-1971

Research Chemist, Celanese Research Co.(NJ)

- Supervisor, Separations Laboratory
- Worked with plastics, chemical, wood products, fibers



1987-1990

EM Science (U.S. Affiliate of E. Merck) (NJ)

- General Manager, Chromatography Business, U.S.
 - TLC, HPLC, Bulk silica, sample prep
 - Hitachi HPLC Systems (sales/marketing, strategic planning)



1990-2013 (Retired)

Hewlett-Packard (PA) → Agilent (DE)

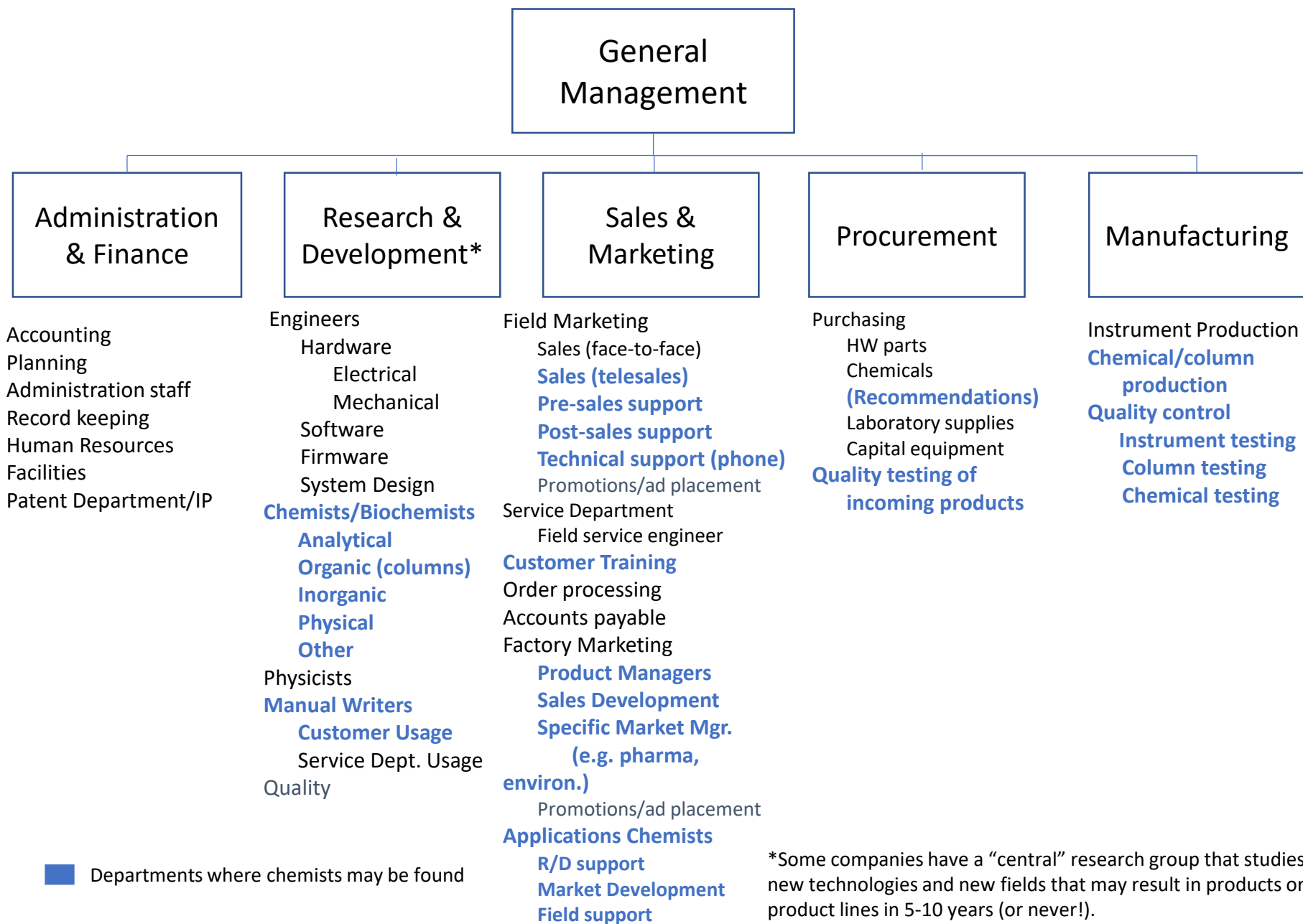
- Product Marketing Mgr., Sample Prep Automation
- Business Dev. Mgr. Americas, Columns and Supplies
- WW Product Marketing Specialist, Cols. & Supplies
- Senior Chemist, Exec. Staff Position

Generic Job Type Based on Educational Degree*

Degree	Assignment	Managerial Assignment
High School Diploma	Simple routine analyses and tasks	Reports to more senior chemist
Assoc. Degree (2 yr.); chemical technology	Routine, simple instrumental analyses	Reports to more senior chemist
Bachelor of Science	More complex analyses; some independent tasks	Supervises technicians
Master's Degree	Development of more complex analytical methodologies; independent work; specialist assignment	Supervision of degreed chemists and technicians
Ph.D.	Deep application of analytical science to problem solving and developing technological understanding; senior member of project team	Supervision of degreed chemists and technicians; project leadership; more experienced chemists on executive staff

*Adapted from "Professional Analytical Chemists in Industry"; short course by Procter & Gamble.

Typical Organization Chart for Instrument Company



■ Departments where chemists may be found

*Some companies have a “central” research group that studies new technologies and new fields that may result in products or product lines in 5-10 years (or never!).

Role of Chemist in the Instrument R/D Department

R/D Chemist

Typical Job Requirements

- Works with multifaceted team (e.g. engineers, software, applications, manufacturing)
- Provide inputs on design features
- Define instrument specifications
- Provide “voice of the customer”
- Provide ideas for and carry out testing of modules and/or final product to make sure that they/it meets design specifications.
- Ensure product usability and for serviceability
- Keep abreast of new technology
- Multifunctional project meetings
- Help to coordinate α - and β -testing
- Some travel involved

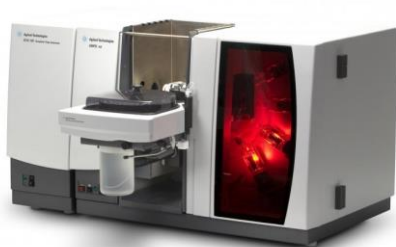


Role of Chemist in the Instrument R/D Department/ Factory Marketing

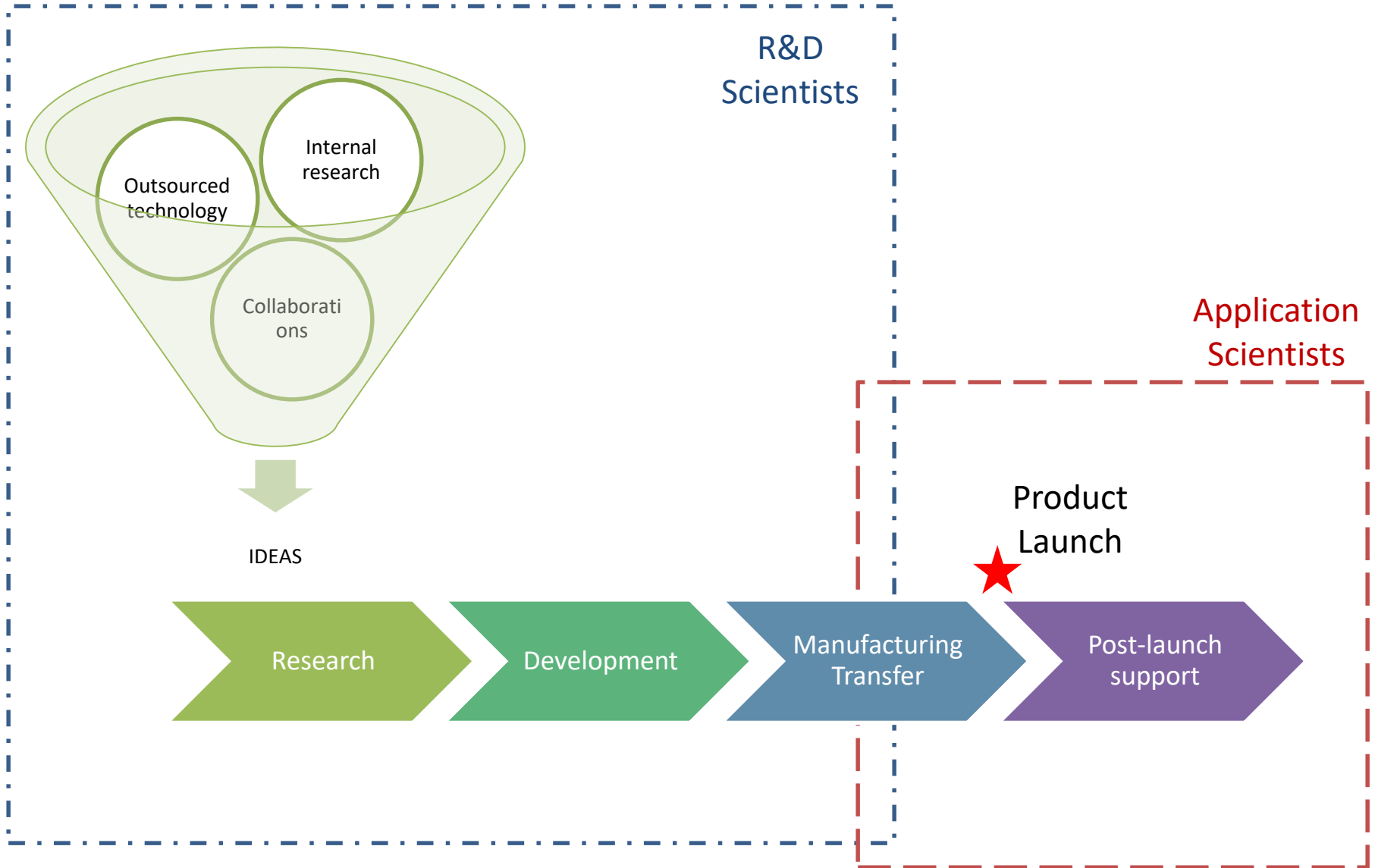
Applications Chemist

Typical Job Requirements

- Application testing of instruments
 - Providing applications for promotional materials
 - Ensure instruments meet user requirements
- Assist product managers and promotions department in preparing market introduction materials
- Submit papers/posters to conferences and exhibitions
- Assist training of field specialists
- Participate in “roadshows” and seminars
- Develop materials for specific market segments (e.g. pharma, environ., foods, etc.)
- Scientific activities to further increase knowledge in technical or application fields.
- Some travel involved



Product Development Life Cycle*



(*courtesy of Moon JUNG, Waters)

Main Roles of Chemist in the Field Marketing Dept.

Pre-Sales

Typical Job Requirements

- **Telesales (BS level chemist)**
 - Provide customers with technical information to make buying decision
 - Works with “face-to-face” field sales as a team
 - Specific sales territory (e.g. NJ/PA, pharma accounts in CA, OR).
 - Sales quota; salary may be based on total sales volume
 - Little to no travel
- **Pre-sales Technical Support (BS-Ph.D.)**
 - Works with face-to-face sales representative to demo instrument to customers
 - Works with customer in their own lab to demonstrate instrument capabilities
 - Works with “Factory Marketing” to train sales force on new product introductions.
 - May present general and in-house seminars, provide customer applications assistance
 - Travel may be involved



Main Roles of Chemist in the Field Marketing Dept.

Post-Sales

Typical Job Requirements

- **Post-sales Technical Support (BS-Ph.D.)**
 - Works with customer after purchase to get instrument up-and-running; brief operation training
 - Spends some time in lab assisting customers in setting up their application
 - Provides direct technical support to customers in assigned territory
 - Works on joint projects with customer (resulting in app notes, presentations, publications)
 - Present seminars for customers in local geography
 - In some situations, time spent on technical support is billable.
 - Travel is involved
- **Technical Support (Phone) (BS-MS)**
 - Provides technical support (hardware and applications) via telephone
 - Backup to Post-Sales support team when they are “on-duty” in customer’s lab
 - Provides limited amount of instrument service support (“Fix my broken instrument”) but such problems usually handled by a field service engineer

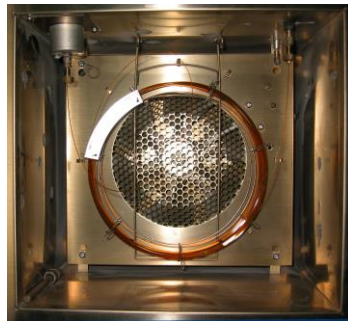


Main Roles of Chemist in the Field Marketing (continued)

Typical Job Requirements

Customer Training (BS-Ph.D.)

- Provides in-depth training courses on instrument and software operation
- Provides in-depth training courses on basic methodology (e.g. basic HPLC, basic mass spectrometry, basics of nmr, etc.)
- Provides in-depth training courses on method development, optimization, column selection, etc.)
- Could provide in-house/on-site courses for larger companies
- Customer training courses are usually provided worldwide in local languages.
- Courses are usually fee-based
- Some travel involved



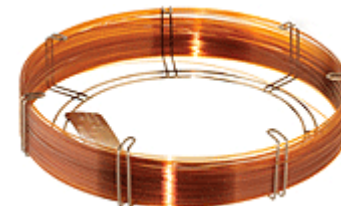
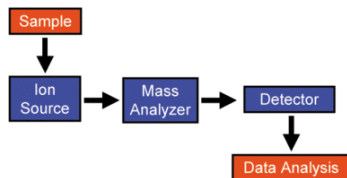
Main Roles of Chemist in Procurement and Manufacturing

Procurement (Purchasing)

- Assist purchasing people in selection of chemical-based purchases (e.g. solvents, chemicals, etc.)
- Testing of chemical-based products coming into factory to ensure that they meet specifications
- Specify laboratory supplies needed to support product development and applications
- May not be a full-time job but an additional assignment from R/D, Applications or Manufacturing

Manufacturing (Order Fulfillment)

- Assist R/D to transfer instrumentation or chemistry project to manufacturing.
- Train manufacturing technicians on manufacturing and procedures involving chemical testing.
- Work with R/D to develop quality testing procedures for new products.
- Troubleshoot any chemically-related problems that may appear during production and testing.
- For HPLC column manufacturing, define production specifications for column testing (e.g. plates, α , pressure, tailing factor, etc.); same for GC column production.



Advice that I Would Give to Chemist Who Would Like to Work in an Instrument Company

- Get the best possible education; a Ph.D. is highly recommended
- Keep yourself up-to-date on technology
 - take advantage of trainings
 - read the literature
 - attend conferences
- Develop excellent writing and presentation skills; present papers at chemistry meetings
- Work on your interpersonal skills; teamwork is a key to success. No longer can “do it alone”.
- Interdisciplinary teams are becoming the norm; gain a better understanding of the roles of others (non-chemists) in successful product development and sales.
- Venture outside of your “comfort” zone (your career may take a different direction); volunteer to take on tasks outside of your direct responsibility
- Be flexible as your career develops
- Learn a little about the business side; some companies will even give you the opportunity to earn an MBA if you show an inclination for the business side.



Ron's Personal Reflections of Other Areas of Involvement

1. Participate in customer advisory teams.
2. Internal consulting with other departments.
3. Outside collaborations with industry, government and academic laboratories
4. Participate in merger and acquisition activities with senior management.
5. Work with outside suppliers on OEM products; evaluate possible OEM products.
6. Organize and/or chair Symposia, technical sessions and other external meetings.
7. Become involved with ACS, HPLC series, AOAC, FACSS and other specialized meetings.
8. Get involved in professional scientific society activities: ACS, ASTM, ASMS, etc.
9. Serve on academic campus recruiting team(s).
10. Consulting after retirement. For previous company or in your area of expertise.
11. Take part in worldwide product introduction activities.
12. Participate in professional training programs (e.g. management courses, finance & accounting, time management, chirality, fundamentals of proteomics, behavioral interviewing, developing a marketing plan, etc.)
13. Take overseas assignment to understand foreign cultures and business acumen.
14. Increase your value to the company (e.g. get involved with activities outside of your "normal" job description, further your education, have a mentor for guidance).

Parting Comments



- Working in the analytical instrument business is fun, challenging, salary competitive, with advancement opportunities.
- Can work on projects on the leading edge of scientific development.
- Can work directly with cross-functional teams to expand your overall knowledge outside of your chosen field.
- Can have opportunities to travel as much (or as little) as you desire.
- You are encouraged to publish and make presentations
- Have the chance to make career adjustments/changes as opportunities arise
- Can choose to be a “generalist” or “specialist” depending on your inclination
- Can work closer to development area (“factory”) or closer customer-oriented area (“field”) depending on where your interests lie.

Acknowledgements

I would like to acknowledge the help and assistance of Dr. Martin Gilar and Dr. Moon Chul Jung of Waters and of Dr. Bill Barber R/D Mgr. Agilent Technologies (retired, now with On Deck Consulting) for their thoughts and inputs on different aspects of this presentation.