

**Crystal Welch**  
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**Education:** Bachelor of Science, Biochemistry, Colorado State University, Fort Collins, CO  
Minor: Chemistry Attendance: August 2001- May 2004  
Pursuant of a Bachelor of Science, Chemical Engineering, Colorado School of  
Mines Golden, CO Attendance: August 2000 – May 2001

**Skills:**

- GDP/GMP/GLP training through Merck Pharma
- HPLC testing on protein (SEC, SP, CEX, RP, IMP, Peptide Mapping), on Waters instruments with Empower2 software
- Method owner, trainer and author for many HPLC methods
- Western Blot, ELISA, SDS-Page, PCR, EMSA
- Bradford analysis, Endotoxin by plate reader, Bioburden by plated filtration, UV by cuvette, TOC, FTIR.
- LC Column purification, dialyzation, lyophilization (Karl Fisher).
- Computer skills include Microsoft Word, Excel, Power Point, and Outlook. Research on the Internet. Experience with specialized software such as Unicorn, used with HDMI skids in large scale FPLC manufacturing.
- Animal handling: Mosquitoes, ticks, fleas, mice, chickens, hamsters, rats, rabbits, guinea pigs and other small creatures as well as farm stock and large domesticated animals such as cattle.
- Mammalian cell culture, sterile technique, large scale fermentation of Ecoli based products
- Radiation Mod Zero training at Colorado State University and various radioactive materials training through Cotter Corp.
- LECO (a carbon/nitrogen/hydrogen flame analyzer), wet nitrogen analyzer equipment, and Atomic Analyzer

**Relevant Coursework:**

Biochemistry I & II with lab	Cell Biology with lab	Analytical Chemistry with lab
Organic Chemistry I & II	Statistics for Biochemistry	Mechanisms of Genetics with lab
Physical Chemistry	Molecular Biology	Pharmacology
Cellular Biochemistry lab	Molecular Genetics with lab	Biology of Cancer (2009)

**Relevant Experience:**

**Merck Boulder** Boulder, CO March 2005- Present  
*Analytical Services Chemist (from 06/06 to present)*

- Support manufacturing through the in process analysis of samples in an EU and FDA regulated environment.
- Testing of on-site environmental samples to ensure clean processing including LAL of water system, TOC, TMC, Basic water chemistry, Air Viables, Surface Viables, and general environmental monitoring procedures.
- Method owner, author and main trainer in department for the majority of controlled HPLC methods for multiple products.
- Creation and Validation of spreadsheets used to report results for various test methods as well as author for the applicable SOP's
- Control creation, review statistical analysis and updating for various test methods. Control and Standard data basing, statistical analysis for tracking purposes, release and testing.
- Equipment and systems validation including IQ/OQ/PQ under EU and FDA regulations

***Manufacturing Production Associate II (03/05 to 06/06)***

- GMP-GDP practices in an EU and FDA regulated environment
- Filing and upkeep of paperwork for all manufacturing equipment including tanks, homogenizers, pH meters, autoclaves etc.
- Prepare, operate and CIP all vessels used in fermentation process for a therapeutic protein.
- Prepare, operate and store HIC and QS/SP columns used in purification process.
- Initiate and complete deviations, write and revise SOPs, and completing CAPAs and Change Controls

**Center for Disease Control, Fort Collins, CO GS 4040-04-1**

***Laboratory/Insectary Assistant***

September 2003 – September 2004

- Cleaned lab equipment and maintained growing facilities including cages and growing pans
- Fed and keep mosquito populations used in Yellow Fever/West Nile research
- Made solutions and blood fed mosquitoes by injecting mice on a weekly timetable
- Attended biweekly meetings for up-to-date presentations
- Dissected and sorted/sexed wild caught mosquitoes for several studies
- Prepared and tested mosquitoes for West Nile virus by PCR

**Colorado State University, Soil/Crop Sciences, Fort Collins, CO**

***Laboratory Tech/Field Researcher***

September 2001 – May 2003

- Sorted grasses for a recount project on grassland production and entered data into Excel
- Ground grass samples and ran hydrogen, nitrogen, and carbon content using a LECO analyzer.  
Counted seed production status on particular grass species
- Participated in prairie dog research and recount projects

**Cotter Corporation, Canon City, CO**

***Chemistry Laboratory Tech***

May – August 2001

- Analyzed environmental samples for Uranium content in air, water, soil, urine, and grass.
- Wrote SOP on organic amine testing in solutions under supervision
- Collected and analyzed test samples from plant production
- MSHA and OSHA certified

**Colorado School of Mines, Chemistry Department, Golden, CO**

***Laboratory Tech***

September 2000 – May 2001

- Waste management with training prior to handling.
- Set up lab stations for general chemistry labs, cleaned and calibrated equipment.
- Stock room assistant and recorder of usage