

CALEB J. GAMMON

Experimental and computational biologist

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SUMMARY

Biologist with six years of experience across the bench and the codebase. I run hands-on experimental biology, cell culture, quantitative assays, and high-throughput automation, and I build the tooling to analyze what comes off it: RNA-seq and single-cell pipelines, computer-vision image analysis, and reproducible data infrastructure. Outside the lab I have shipped two production systems for a marine service company in South Florida: a CP-SAT field-work scheduler and a weekly invoicing pipeline validated against the manual process it replaced.

EXPERIENCE

Senior Research Services Professional, Bonetto Lab, CU Anschutz

Aug 2024 -- Present (promoted Dec 2025)

Cancer cachexia research on musculoskeletal wasting in oncology.

- Run mammalian cell culture (primary and immortalized, adherent and suspension), transfection, and cell-line maintenance under aseptic technique; build and optimize in vitro conditioning and 96-well phenotypic screening workflows.
- Develop and execute quantitative assays: ELISA, multiplex cytokine profiling (Luminex), Western blot / SDS-PAGE, qPCR, and nucleic-acid and protein extraction.
- Sole computational biologist in the lab; design, implement, and maintain all in-house RNA-seq and single-cell pipelines, from QC through differential expression and pathway analysis.
- Own day-to-day lab operations (purchasing, vendors, equipment readiness, experiment scheduling, SOPs, training) and lead the lab's external biotech collaboration across requirements, execution, analysis, and communication.

Lab Researcher / Student Researcher, Seibold Lab, National Jewish Health

May 2020 -- Jul 2024

Airway epithelial biology and asthma genomics.

- Cultured and differentiated primary human airway epithelial cells at air-liquid interface into 3D pseudostratified tissue and established immune-cell co-culture models.
- Automated high-throughput nucleic-acid extraction, NGS library preparation, and qPCR on the Beckman Coulter Biomek i7 (96 to 384 well, more than 80 samples per run).
- Performed multiplex cytokine profiling (Luminex Magpix), 10x Chromium chip loading, and FFPE / immunostaining; analyzed GeoMx DSP spatial transcriptomic data; documented protocols in Labguru ELN and cross-trained team members.

SELECTED BUILDS & AUTOMATIONS

SchedLab

Public constraint-scheduling demo

- Self-serve scheduling demo on synthetic data, with marine-service and lab-operations presets on one engine and constraint model.
- Compares a constraint-blind greedy dispatcher, a constraint-aware heuristic, and a CP-SAT optimizer under one validator; users can inject urgent work, disable resources, and change overtime, due dates, skills, consumables, durations, and pins.
- Treats hard constraints as hard: infeasible states return no schedule. The diagnostic layer names the binding conditions, proposes candidate relaxations, and re-solves each one, labeling any option it could not verify within the diagnostic budget rather than presenting it as a fix.
- Clicking an assignment exposes the binding facts behind it (due date, capability tier, travel grouping, remaining capacity, pins, legal slots); scenario state is reproducible from preset plus seed plus overrides and shareable by URL.
- Benchmarked across 50 seeds per preset under a 3-second solve limit: CP-SAT improved the shared weighted objective on every comparable seed, and the analysis reports the metrics where the baseline does better.

Adaptive Work-Order Scheduler

Private production system

- CP-SAT scheduling and decision-support system for a marine service company in South Florida: mobile field work across 17 sites, roughly 12 new work orders per day.
- Models technician skills, priority and due dates, expected duration, part readiness, daily capacity, travel, and customer-pinned commitments, and plans around pre-booked service rather than moving promises.
- Plans a normal day to 6 hours with controlled stretch to 8 hours, both including driving, leaving headroom for overruns and mid-day arrivals.
- Keeps the domain expert in the loop: assignments are proposed for review and write-back stays gated until the schedule has earned operational trust. Capacity-curve analysis reports how long the open backlog takes without overtime.

Weekly Invoice Automation

Production workflow

- Replaced a recurring manual export with a scheduled Node.js pipeline that pulls completed work orders through an external API, rebuilds invoice PDFs, groups them by local completion date, zips the week, and emails the archive for review, preserving the folder and document structure reviewers already worked from.
- Validated against an independently produced reference week: 60/60 correct orders, 60/60 correct day assignments, 60/60 word-for-word invoice-text matches across roughly 8,700 words, and 60/60 unchanged financial totals.
- Handled undocumented and incorrect API behavior, timezone boundaries, fixed-versus-percentage tax semantics, private-comment visibility, attachment-size limits, and dry-run and fail-loud safety behavior.

MyoMeasure

Scientific computer vision

- Cellpose-SAM segmentation with custom QC and object filtering, replacing hours of manual C2C12 myotube measurement with reproducible high-throughput phenotyping; benchmarked against blinded human raters and validated against dexamethasone-induced atrophy. Manuscript in preparation.

Scientific Workflow Tools

Analysis automation and data products

- End-to-end RNA-seq pipeline (fastp, Salmon, DESeq2) with automated QC, reporting, and reproducible environments, benchmarked against institutional nf-core workflows. github.com/gammon-bio/rnaseq_pipeline
- AI-assisted qPCR workflow turning raw Ct values into ΔCt / $\Delta\Delta Ct$ analysis and plots in about one minute, and a deployed Cachexia Atlas integrating published bulk and single-cell/single-nucleus datasets with provenance tracking.

TECHNICAL SKILLS

Cell & molecular biology: Primary and immortalized mammalian cell culture, aseptic technique, ALI airway models, immune-cell co-culture, transfection, RT-qPCR, Western blot / SDS-PAGE, RNA/DNA and protein extraction and quantification, immunofluorescence microscopy.

Assays & screening: ELISA, multiplex immunoassays (Luminex Magpix), phenotypic assay development, 96 to 384-well HTS, skeletal-muscle histology (CSA, SDH, fiber typing), mouse colony management.

Automation & imaging: Biomek i7 liquid handling, NGS library preparation, high-throughput microscopy image analysis (Cellpose-SAM), GraphPad Prism, Labguru ELN.

Bioinformatics: RNA-seq (fastp, Salmon, DESeq2), single-cell/single-nucleus (Scanpy, Seurat, Harmony), differential expression, pathway enrichment (GSEA, fgsea, enrichR).

Software: Python, R, Bash, JavaScript/Node.js, Git; CP-SAT / OR-Tools; REST APIs, scheduled workflows, GitHub Actions; reproducible environments (Conda, Snakemake, Make, Docker); Railway; Claude Code.

Operations: Purchasing and inventory, vendor coordination, equipment readiness, experiment and resource scheduling, SOP authoring, onboarding and training, external collaboration.

SELECTED PUBLICATIONS & PRESENTATIONS

1. Huot JR, Kamdar UR, Gammon CJ, et al. "An FGF21-IGFBP1 tumor-liver relay drives musculoskeletal defects in colorectal cancer cachexia." *Nature Communications*. 2026. doi:10.1038/s41467-026-77305-6
2. Pöllänen N, Gammon CJ, Pin F, et al. Chemotherapy induces tissue NAD⁺ loss, and downregulation of NAD⁺ biosynthetic enzyme Nrk2 marks muscle wasting. *bioRxiv*. 2026 (preprint). doi:10.64898/2026.07.11.736679
3. Jamnick NA, Livingston PD, Gammon CJ, et al. MOTS-c partially protects against skeletal muscle deterioration in C26 cachexia. *Frontiers in Medicine*. 2026;13:1838178. doi:10.3389/fmed.2026.1838178
4. Jamnick NA, Livingston PD, Gammon CJ, et al. Vincristine impairs musculoskeletal development in pediatric mice. *BMC Cancer*. 2025;25(1):1782. doi:10.1186/s12885-025-15262-x
5. Livingston PD, et al. (incl. Gammon CJ). B0092 tumor-bearing mice are a new model for cachexia in head and neck cancer. *Am J Physiol Cell Physiol*. 2025;329(2):C646-C658. doi:10.1152/ajpcell.00374.2025

Presentations: Cancer Cachexia Conference (Turin, 2025, co-first author); Muscle Biology & Cachexia Conference (Houston, 2025, poster); National Jewish Health Research Retreat (Denver, 2024, oral).

EDUCATION & AWARDS

B.A. Molecular, Cellular & Developmental Biology and B.A. Neuroscience, University of Colorado Boulder (GPA 3.7, 2023). National Jewish Health Research Retreat, Abstract Competition Winner and Conference Speaker (2024).