

Dear Editors,

I am pleased to submit our manuscript entitled “*Cancer Alpha: Production-Ready AI for Clinically Relevant Multi-Cancer Genomic Classification*” for consideration as an Article in *Nature Communications*.

In this work, we present **Cancer Alpha**, a production-ready artificial intelligence system that achieves **95% balanced accuracy** on verified *The Cancer Genome Atlas* (TCGA) patient data across eight major cancer types, without the use of synthetic data. This represents a rare convergence of **state-of-the-art AI performance**, **multi-modal genomic feature integration**, and **enterprise-grade deployment infrastructure**, all validated on authentic clinical datasets.

Cancer Alpha’s architecture integrates mutation profiles, copy number alterations, methylation data, and clinical variables into a unified multi-modal classification framework, supported by explainable AI methods (SHAP) for transparent decision-making. Beyond the scientific contribution, we demonstrate a **full production deployment pipeline**—including Dockerized containers, Kubernetes orchestration, API-based inference, and security measures—bridging the gap between research prototypes and clinically deployable AI.

To our knowledge, this is the **first study to combine high clinical accuracy with production readiness in a multi-cancer genomic AI system**. The results have significant implications for precision oncology, enabling scalable diagnostic support tools and accelerating the path from research to real-world clinical adoption.

Given *Nature Communications*’ broad readership across computational biology, cancer research, and translational medicine, we believe this work will be of strong interest to both biomedical researchers and the AI/ML community.

We confirm that this manuscript is original, not under consideration elsewhere, and all authors have approved its submission. We have adhered to the journal’s policies on ethics and data availability, with all code and data processing workflows openly documented for reproducibility.

Thank you for considering our submission. We look forward to the opportunity to share our findings with the *Nature Communications* readership.

Sincerely,

R. Craig Stillwell