



## Colorado Science and Engineering Fair

## 2025 Individual Project Abstract Form

**Please print 2 copies of the completed form. Sign both copies, keep 1 for your notebook and submit 1 copy to your Regional Fair Director with your other paperwork.**

Title of Project: Original Kitchen Insulin

Finalist's Name: Elsa Ciembronowicz

School and City: Vallis Cymbia Academiaie Homeschool

Sponsor's Name: Hana Ciembronowicz

Category: Biomedical & Health Sciences

Division: Junior (grades 6 - 8)

Abstract (250 words or less):

Insulin is a pancreatic hormone that moves glucose giving energy and managing blood sugar. If you don't make enough or efficiently use it, you develop hyperglycemia which can lead to diabetes. Insulin was officially discovered in 1921 by Frederick Banting under the direction of Charles Best. In January 1922, Banting began working with Prof. John James Rickard Macleod which won them the Nobel Prize in Physiology of Medicine. On January 23, 1923, Banting, Collip, and Best submitted and were awarded an American patent.

During the COVID, Johns Hopkins Bloomberg School of Public Health studied the hoarding of insulin and supply chain disruption. The scarcity of insulin was also seen during WWII. This prompted my hypothesis, "Could one isolate insulin by using the original 1923 patent, serial number 612,158?"

Yes, you can isolate insulin at home using the 1923 patent procedure with common items obtainable from Amazon or any high school laboratory and your local butcher. I was able to isolate a small portion of insulin from a cow pancreas. With additional procedures by Banting and Collip, I went on to obtain more potency and purity. The analysis of my five solutions was run against a control by a CLIA certified lab with no human or animal testing. Potency increased with each sample, but the concentration was significantly lower than current medications and equivalent to those done on the first 1922 tests. Time release testing was not the focus of this study, nor was this intended to create pharmaceutical grade medications.

*I hereby certify that the above statements are correct and the information provided in the Abstract is the result of one year's research. I also attest that the above properly reflects my own work.*

Finalist's Signature:

Date:

In addition, all students must complete the ISEF Student Checklist (1A), Research Plan, Approval Form (1B), and Checklist for Adult Sponsor (1), and any other ISEF forms required for this type of project. See the International Rules and Guidelines for form requirements. Return COPIES of all of these forms to your Regional Fair Director with you Finalist Verification/Permission Form. **A signed copy of this form must be included in your notebook.**