SILAC

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OUR TEAM

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ELEMENTS

Introduction

Applications

Advantages of SILAC

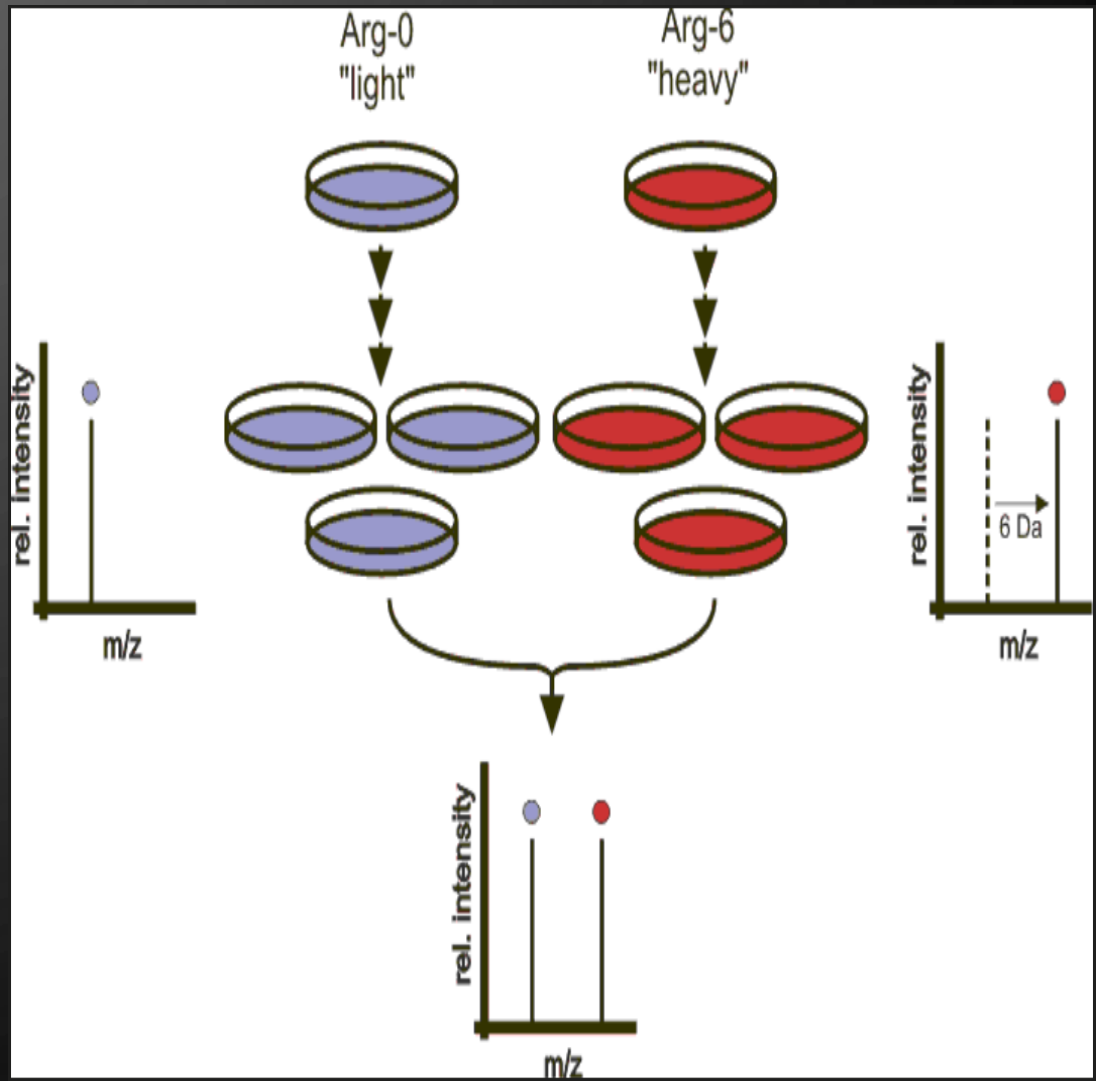
INTRODUCTION

What does SILAC mean?

Stable Isotope Labeling by/with Amino acids in Cell culture (SILAC) is a technique based on mass spectrometry that detects differences in protein abundance among samples using non-radioactive isotopic labeling.It is a popular method for quantitative proteomics.

CLARIFICATION

- **The Principle Of SILAC**. Cells Are Differentially Labeled By Growing Them In Light Medium With Normal Arginine (Arg-0, Blue Color) Or Medium With Heavy Arginine (Arg-6, Red Color). Metabolic Incorporation Of The Amino Acids Into The Proteins Results In A Mass Shift Of The Corresponding Peptides. This Mass Shift Can Be Detected By A Mass Spectrometer As Indicated By The Depicted Mass Spectra. When Both Samples Are Combined, The Ratio Of Peak Intensities In The Mass Spectrum Reflects The Relative Protein Abundance. In This Example, The Labeled Protein Has The Same Abundance In Both Samples (Ratio 1).



APPLICATIONS

- A SILAC Approach Involving Incorporation Of TYROSINE Labeled With Nine Carbon-13 Atoms (^{13}C) Instead Of The Normal Carbon-12 (^{12}C) Has Been Utilized To Study Tyrosine Kinase Substrates In Signaling Pathways. SILAC Has Emerged As A Very Powerful Method To Study Cell Signaling , Post Translation Modifications Such As Phosphorylation, Protein–protein Interaction And Regulation Of Gene Expression. In Addition, SILAC Has Become An Important Method In Secretomics, The Global Study Of Secreted Proteins And Secretory Pathways.It Can Be Used To Distinguish Between Proteins Secreted By Cells In Culture And Serum Contaminants.Standardized Protocols Of SILAC For Various Applications Have Also Been Published.
- While Silac Had Been Mostly Used In Studying Eukaryotic Cells And Cell Cultures, It Had Been Recently Employed In Bacteria And Its Multicellular Biofilm In Antibiotic Tolerance, To Differentiate Tolerance And Sensitive Subpopulations.

ADVANTAGES OF SILAC

- THE GREAT ADVANTAGES OF SILAC LIE IN ITS

1) **STRAIGHT-FORWARD IMPLEMENTATION.**

2) QUANTITATIVE ACCURACY.

3) AND REPRODUCIBILITY OVER CHEMICAL LABELING OR LABEL-FREE QUANTIFICATION STRATEGIES.

FAVORING ITS ADOPTION FOR PROTEOMIC RESEARCH.

THANK YOU