

# In vitro screening assay using the murine pre-adipocyte cell line 3T3-L1 to study anti-obesogenic or obesogenic activities of chemical compounds.

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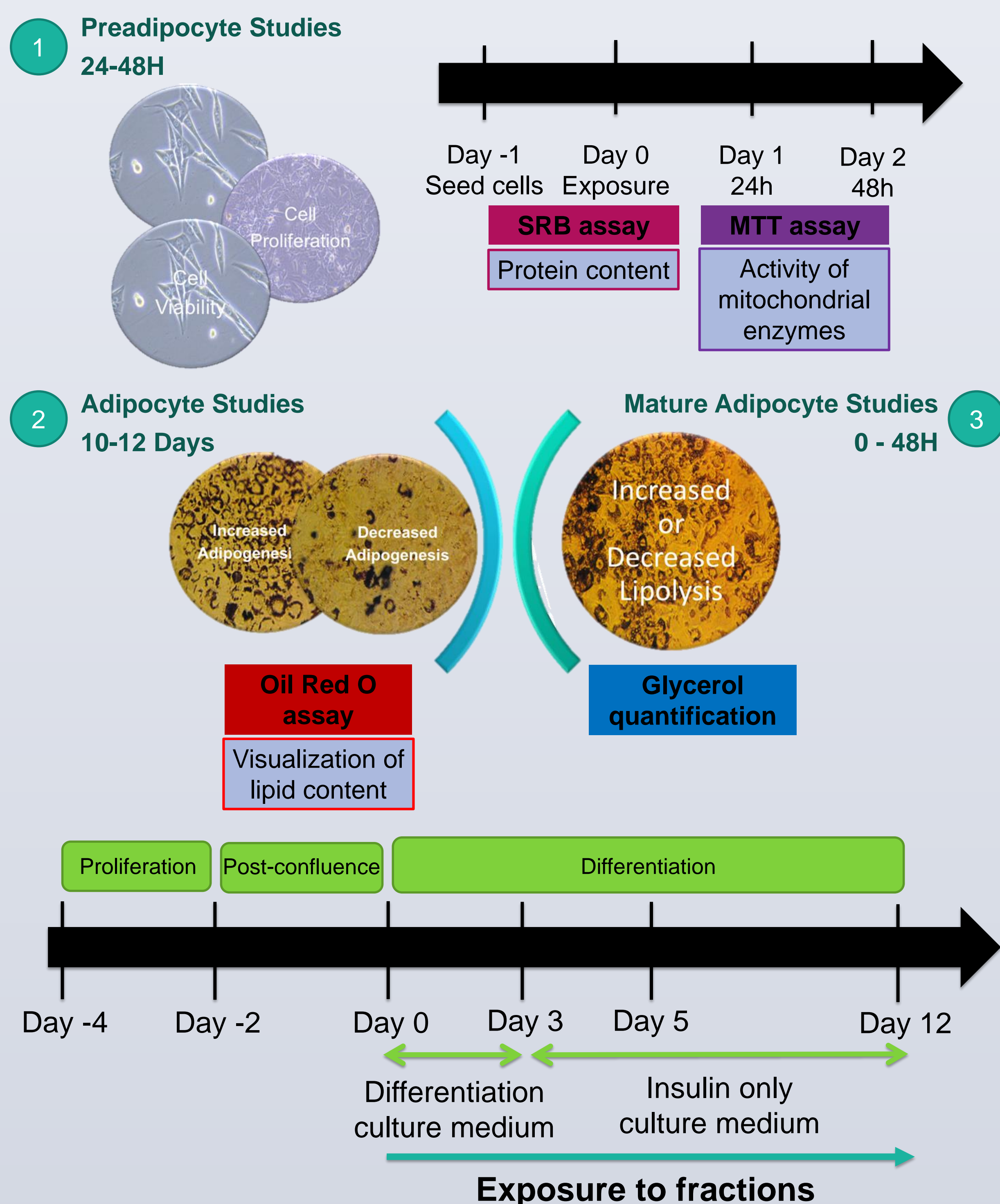
## Introduction

Portugal has the third highest frequency of obese women in Western Europe. Some environmental compounds have been suspected to stimulate obesity, as phthalates, bisphenol A and alkylphenols. Other compounds can effectively prevent or treat it.

## Model System

3T3-L1 cells offer an interesting model system to study obesogenic or anti-obesogenic activities of compounds. The following analysis can be performed:

- 1) Proliferation of pre-adipocytes
- 2) Adipogenesis/differentiation
- 3) Lipolysis of mature adipocytes



## Focus of our Work: Cyanobacterial Compounds

The Laboratory of Ecotoxicology, Genomics and Evolution (LEGE) at CIIMAR has a unique collection of cyanobacteria isolated from water samples and solid materials from the Portuguese coast and freshwater systems over the years.

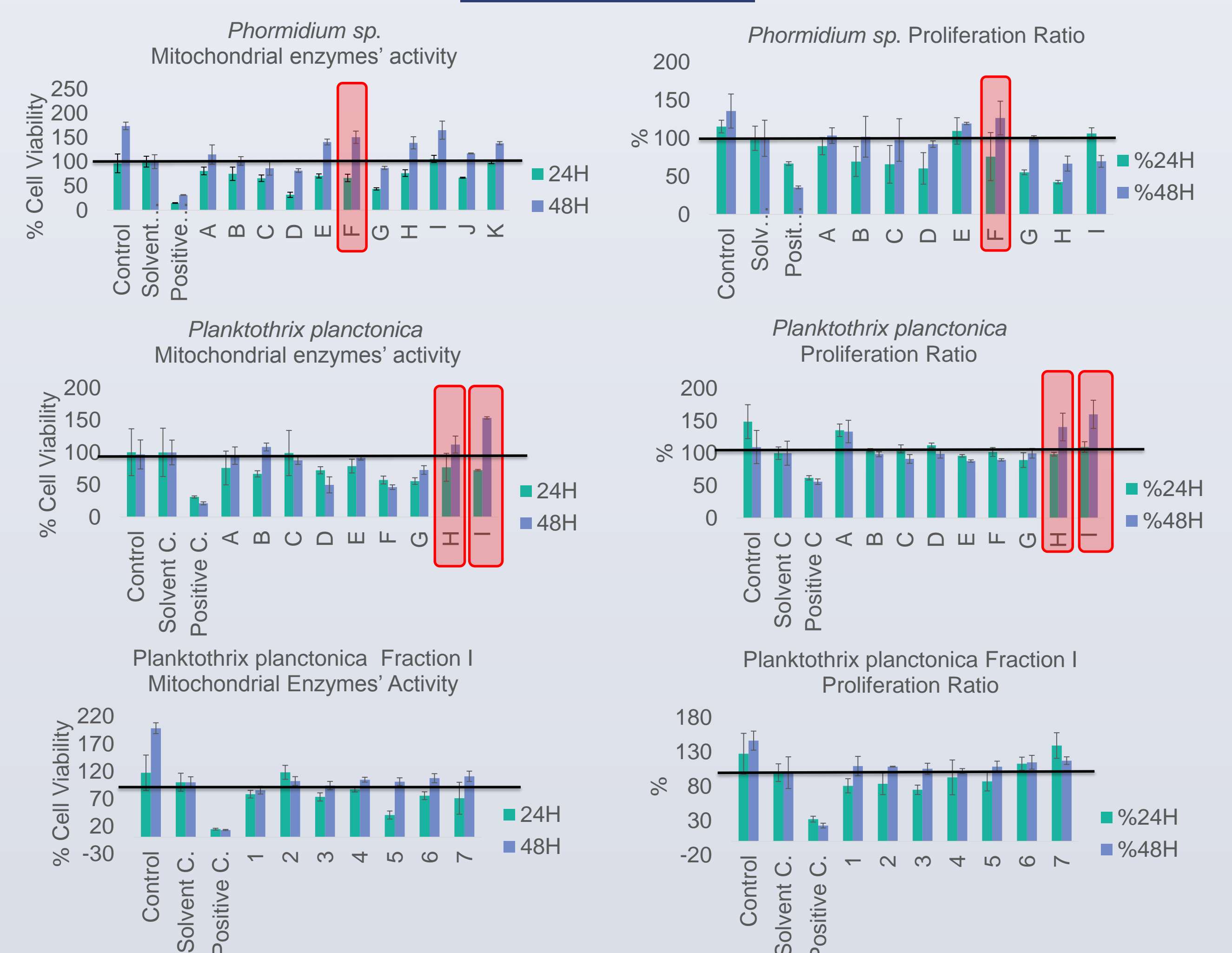
Cyanobacteria are 3,5 billion years old photosynthetic prokaryotes that have shown to be an important source of beneficial natural products.

## Results

Strain	Biomass / g	Extract / g	Yield / %	Fractions	Total mass / mg	Yield / %
<i>Phormidium sp.</i>	16,7679	1,7445	10,40	A-K	2303,9	133,3
<i>Planktothrix planctonica</i>	18,6200	3,0227	16,23	A-I	2693,7	91,4
<i>Synechocystis sp.</i>	24,6338	4,4792	18,18	A-L	3644,5	81,4
<i>Oscillatoria limnetica</i>	13,4345	3,5292	26,27	A-J	2945,2	84,8
<i>Aphanizomenon sp.</i>	28,7120	4,426	15,42	A-J	3060,2	80,6
<i>Limnothrix sp.</i>	17,1140	2,2267	13,01	A-J	1016,3	55,5



## Effects of Cyanobacterial Fractions on Pre-adipocyte Proliferation



## Conclusions and Future Work

- ✓ Using the 3T3-L1 cell line a grand variety of studies can be performed in the adipose tissue. This murine pre-adipocyte cell line allows us to extrapolate results to human systems, since adipose tissue regulation is preserved in higher mammals. Further studies should confirm results in human adipocytes.
- ✓ The polar fraction I (100% Methanol) of *Planktothrix planctonica* has shown promising results, significantly increasing cell proliferation and viability.
- ✓ Following the successful isolation of compounds, we aim to elucidate the chemical structures of new and single compounds with anti-obesogenic activity.

## Acknowledgements

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