Grand Technion Energy Program

תוכנית האנרגיה ע"ש גרנד

Technion Israel Institute of Technology

**תכנית האנרגיה ע"ש גרנד מתכבדת להזמינך להרצאה סמינריונית שתינתן ע"י:**

# לירון תמיר

## התכנית הבין-יחידתית לאנרגיה

**בנושא:**

# Development of Transgenic Plants with Improved Tolerance to Environmental Abiotic Stresses, for the Production of Biofuel

Mankind is currently facing three main challenges: world hunger, lack of energy sources and the deterioration of the environment. Volatility of oil prices, dependency on foreign energy sources and the environmental consequences of carbon emissions are all contributing factors to the current interest and development of renewable energy sources. Biofuels are fuels made from sustainable feedstock. The source of the energy stored in them is in the process of CO2 fixation from the atmosphere to sugar molecules by photosynthesis. Biofuels have many benefits, from reducing fossil fuels dependency to providing new income and employment opportunities in rural areas.

'First generation' biofuels can offer some CO2 benefits and can help to improve domestic energy security. But concerns exist about the sourcing of feedstocks, including the impact it may have on biodiversity and land use and competition with food crops. Moreover, it is clear that research and technological progress must be made to make the production and use of biofuels sustainable, economically efficient and with net positive energy balance. Camelina sativa (L.) is a niche filling oilseed crop that shows potential as a future feedstock for biofuels, specifically biodiesel. Compared to current oilseed crops, it requires lower agricultural inputs, is more tolerant of cool weather, has a shorter growing season and is more efficient in its water use. Improving its drought tolerance and the ability to grow it on marginal land will improve the economic and energetic balance posed by this crop.

To do this, we set the goal to apply technology that was developed in the lab by means of genetic engineering on a biofuel plant. This genetic technology creates an autoregulatory senescence inhibition loop, while using self-powered genetic control which turned on under drought and salinity stress. This system activates Cytokinin synthesis, a plant hormone that inhibits aging and imparts drought and salt resistance. The transgenic Camellia plants showed increased biomass compared to wild-type plants, delayed senescence and resistance to drought and salt stress, without yield loss. Future research is needed, but it seems that the use of these genetically modified plants entails reducing costs and preventing competition for land and water sources.

**מנחה: פרופ' שמעון גפשטיין, הפקולטה לביולוגיה**

**במסגרת עבודת מחקר לתואר מגיסטר**

ההרצאה תתקיים ביום ראשון, ה-10 בינואר 2016, בשעה 15:30
באודיטוריום ע"ש דיוויד וואנג, קומה 3, בנין דליה מידן, הפקולטה למדע והנדסה של חומרים

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