

## ABSTRACT SUBMISSION FORM

LET'S TALK ABOUT

# SEX + GENDER

Exploring the role of sex and gender on health research



## CHR D 2020: Abstract Submission Form

### Submitter Name

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### Title

Extracellular vesicle (EV) characteristics during skeletal muscle differentiation and acute exercise

### Background

EVs are involved in cell-to-cell communication, and contain biomolecular cargo that can affect recipient cell function. EV-subtypes, microvesicles and exosomes, differ based on size, biogenesis, and cargo. EVs are released from all cells, including skeletal muscle (skm). During exercise, skm secretes beneficial myokines that can be enclosed within EVs, particularly exosomes. Skm consists of functional contractile units (myofibers) and dormant, undifferentiated satellite cells (myoblasts, MB).

### Objective

Since both MB and myotubes (MT, immature myofibers) release EVs, we sought to examine the differences in EV signature, and the effect of acute exercise on EVs.

### Methods

C2C12 MB were differentiated into MT, and EVs isolated from conditioned media (CM). MTs were electrically stimulated (1h, 14V) to mimic acute exercise and EVs isolated from control (CON) and stimulated (STIM) CM. We measured EV size, stability, protein concentration, and expression of markers of EV-subtypes. MB were treated with CON/STIM-EVs (6.7 µg/ml) and with EV-depleted media from both conditions for 48-72h. Treated MB were analyzed for changes in mitochondrial content, cell count and viability.

### Results

MT-EVs were 51% smaller with 174% more protein yield and different size distribution profile than MB-EVs. MT-EVs had drastically decreased expression of exosomal (Alix, Tsg101, CD63 and CD81) and microvesicle (ARF6) marker proteins. There was no effect of STIM on EVs. MBs treated with CON/STIM-EVs showed no changes in mitochondrial content and cell viability. Treating MB with EV-depleted media from either condition reduced cell count by 113%-155% at 48-72h, respectively.

**Conclusion**

Our data show that MB and MT release EVs that differ in size, distribution and expression of protein markers. There is no effect of STIM on EVs, nor of CON/STIM-EVs on mitochondrial mass and cell viability. EV-depleted media from either condition severely reduced MB cell count. Further investigation into how EV-depleted media reduces cell count can shed light on the anti-tumorigenic effects of exercise.

**Theme:**

Basic Science

**Do you have a table/figure to upload?**

No

**Are you willing to participate in Goodbear's Den?**

Yes

**Presenter Status:**

Masters Student

**What was your role in the project?**

Perform Experiments

**Authors**

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