

## ABSTRACT SUBMISSION FORM

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# 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 vesicles (EVs) as predictors of individual response to exercise in obese youth

### Background

Heterogeneity in response to exercise training exists in youth at risk of Type 2 diabetes. Differential response to exercise training might be mediated through a different exercise-induced adaptation of extracellular vesicle (EV) release.

### Objective

The purpose of this study was to evaluate if changes in EVs after acute aerobic exercise (AE) were associated with the responders phenotype following 6-week resistance exercise training (6W-RT).

### Methods

This is a single-blinded secondary analysis of the EXIT trial (#02204670), which included 11 inactive youth ( $15.7 \pm 0.5$  years) with obesity ( $BMI \geq 95$ th percentile). Youth underwent an acute bout of AE (60% heart rate reserve, 45 min) at baseline and then a 6W-RT. Primary outcome was the categorization of responders (RE) or non-responders (NRE) based on changes in insulin sensitivity. The primary exposure variables were EV protein concentration, size, stability, and yield using size exclusion chromatography and Western blotting. These analyses were performed using blood samples collected before (AT0), during (AT15,30,45) and after AE (AT120).

### Results

Overall, there was a general increase in EV production in both groups. Average EV size was larger in RE ( $\sim 141$ nm) vs. NRE ( $\sim 97$ nm;  $p < 0.05$ ). There is a trend of a moderate positive correlation between EV size and insulin sensitivity ( $r = 0.44$ ,  $p = 0.08$ ). EV size distribution revealed RE preferentially expressed EVs 200-250nm in size, whereas NRE expressed EVs between 50-100nm ( $p < 0.05$ ). RE-EVs expressed  $\sim 25\%$  lower Tsg101 protein ( $p < 0.05$ ),  $\sim 85\%$  higher MMP2 content, while CD63 levels remained unchanged between the groups. EV protein yield in RE was higher than NRE at AT15 ( $p < 0.05$ ).

**Conclusion**

Our data suggest that youth with obesity that respond to exercise training produce larger EVs, with lower exosome-marker and higher microvesicle-marker protein expression. RE-EVs also had higher EV protein yield during AE. The relationship between larger EVs (e.g. microvesicles), their cargo and ability to respond to exercise has yet to be fully elucidated.

**Theme:**

Basic Science

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

No

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

Yes

**Presenter Status:**

Post-Doctoral Fellows

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

Perform Experiments

**Authors**

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