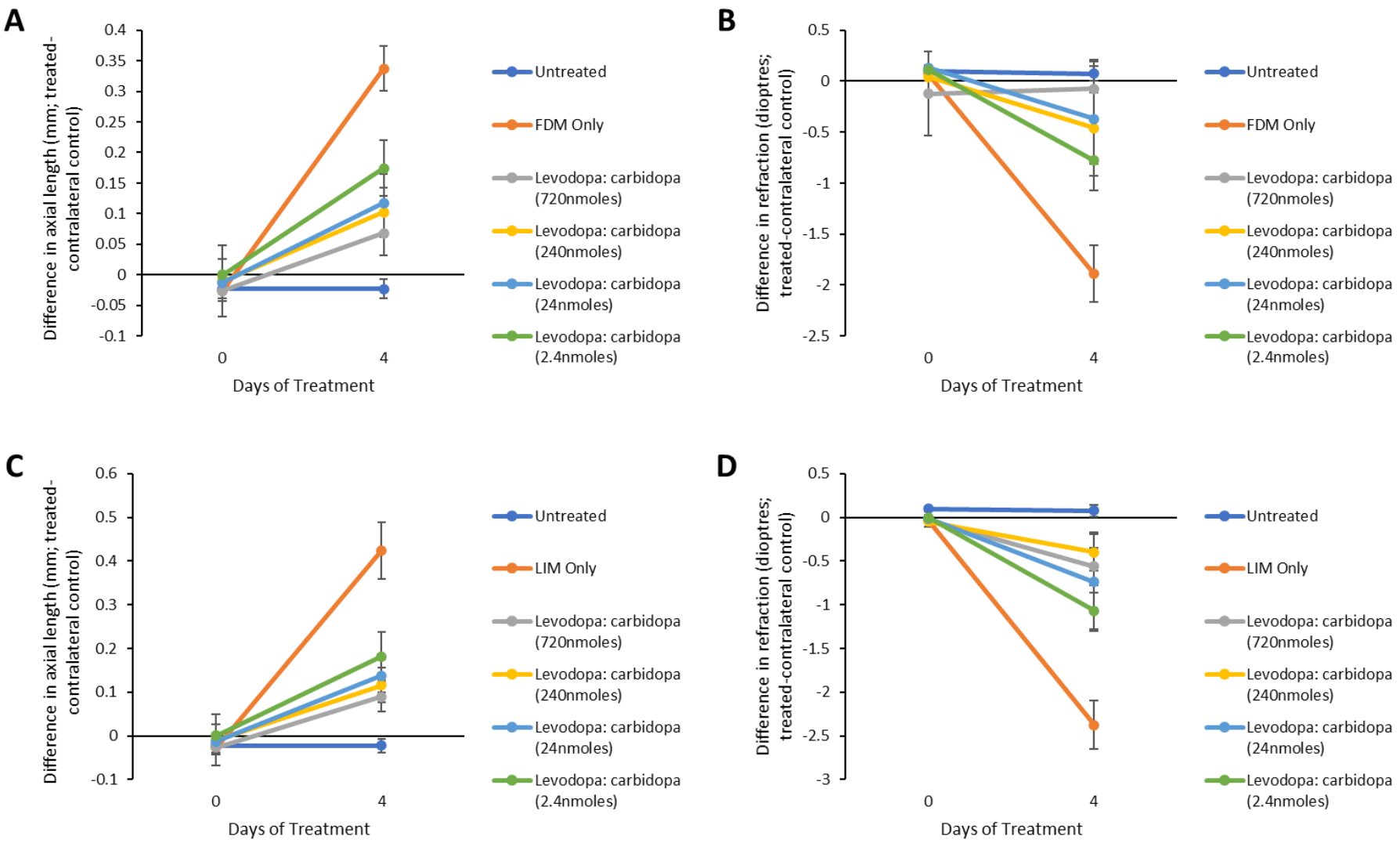
**Supplementary Table S-1: Vitreous Sample MRM transitions** (precursor and product ion(s), with corresponding fragmentor voltage, collision energies, and dwell times for each analyte and internal standard.

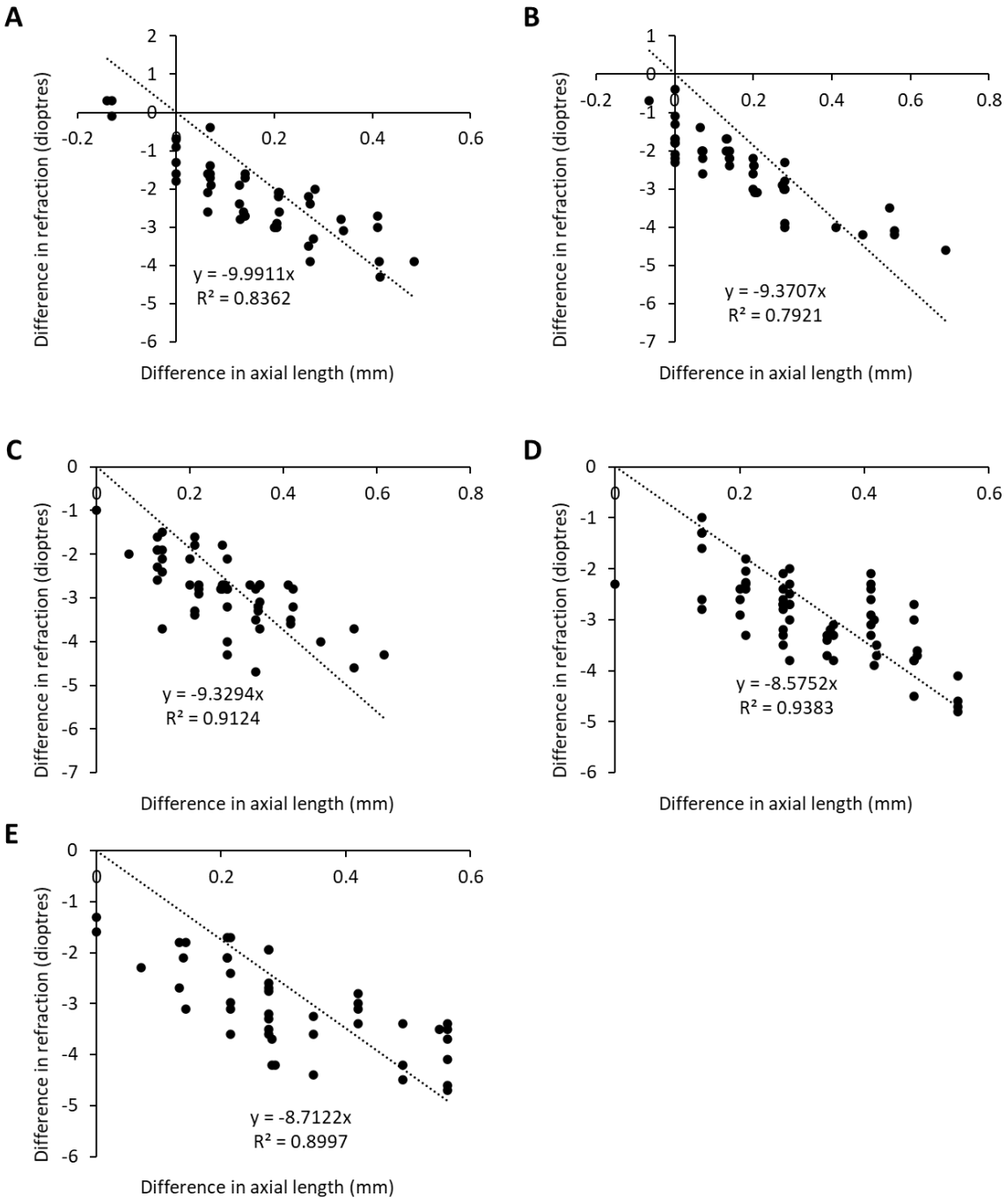
| Analyte/Internal Standard | Precursor Ion (m/z) | Quantifier transition product ion (*m/z*) | Fragmentor Voltage, Collision Energy (volts) | Qualifier transition product ion(s) (*m/z*) | Fragmentor Voltage, Collision Energy (volts) | Dwell time (ms) |
|---|---|---|---|---|---|---|
| **Time Segment 1** (positive ion mode) | | | | | | |
| Dopamine | 154.1 | 137.1 | 62, 8 | 91.1 | 60, 28 | 78 |
| | | | | 65.1 | 60, 40 | |
| Dopamine-$d_4$ | 158.1 | 141.1 | 60, 8 | 95.1 | 60, 28 | 50 |
| Levodopa | 198.1 | 152.2 | 79, 8 | 107.1 | 79, 28 | 78 |
| Levodopa-$d_3$ | 201.1 | 155.1 | 72, 8 | 109.1 | 72, 28 | 50 |
| **Time Segment 2** (negative ion mode) | | | | | | |
| DOPAC | 167 | 123.1 | 60, 4 | - | - | 161 |
| DOPAC-$d_5$ | 172.1 | 128.1 | 60, 4 | - | - | 161 |

**Supplementary Table S-2: ANOVA analysis of levodopa and levodopa:carbidopa's effects on ocular biometry**. ACD: anterior chamber depth, VCD: vitreal chamber depth.

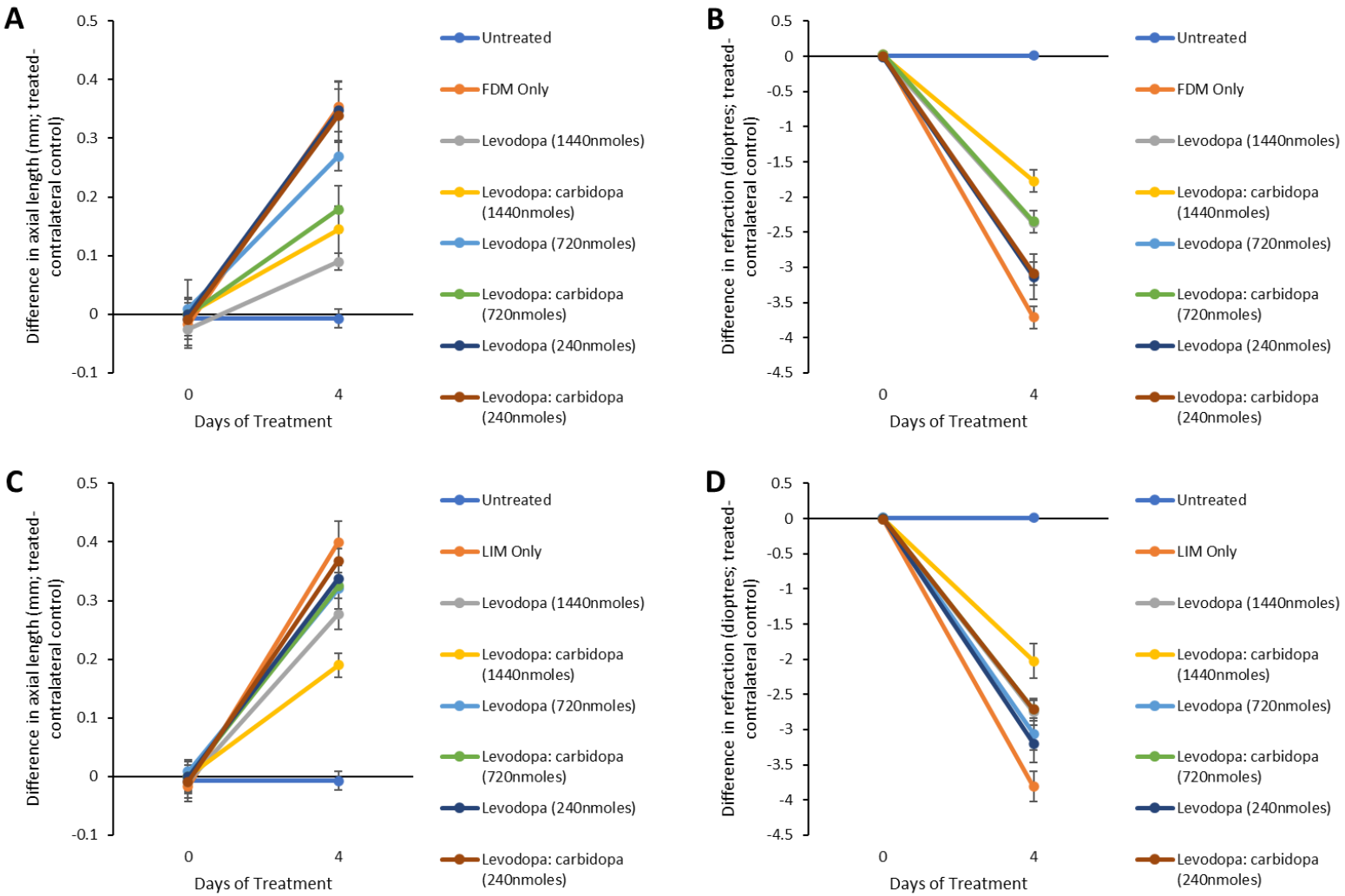
| | Ocular Biometry | | |
|---|---|---|---|
| | ACD | Lens Thickness | VCD |
| Topical levodopa/carbidopa | | | |
| FDM | F(4, 46)=2.015, p=0.108 | F(4, 46)=0.302, p=0.875 | F(4, 46)=3.422, p<0.05 |
| LIM | F(4, 34)=1.194, p=0.332 | F(4, 34)=0.292, p=0.900 | F(4, 34)=8.449, p<0.001 |
| Systemic levodopa and levodopa/carbidopa | | | |
| FDM | F(6,45)=1.607, p=0.175 | F(6,45)=1.023, p=0.414 | F(6,45)=3.497, p<0.010 |
| LIM | F(6,56)=1.945, p=0.072 | F(6,56)=1.231, p=0.303 | F(6,56)=3.472, p<0.010 |




**Supplementary Figure S-1: Changes in axial length and refraction in response to topical levodopa:carbidopa treatment.** **(A)** Axial length and **(B)** refraction measurements from FDM chicks; **(C)** axial length and **(D)** refraction measurements from LIM chicks. FDM: form-deprivation myopia, LIM: lens-induced myopia. Data are plotted as the difference between treated and contralateral control eyes and represent the means ± standard error of the means. Sample sizes (min n=6 per group) can be found in Table 2.




**Supplementary Figure S-2: Correlations between change in refraction and change in axial length in response to levodopa or levodopa:carbidopa treatment.** Black dots represent individual animals from: **(A)** FDM eye drop dose-response experiments; **(B)** LIM eye drop dose-response experiments; **(C)** FDM systemic dose-response experiments; **(D)** LIM systemic dose-response experiments; **(E)** FDM dopamine antagonist experiments. FDM: form-deprivation myopia, LIM: lens-induced myopia.




**Supplementary Figure S-3: Changes in axial length and refraction in response to systemic levodopa and levodopa:carbidopa treatment. (A)** Axial length and **(B)** refraction measurements from FDM chicks; **(C)** axial length and **(D)** refraction measurements from LIM chicks. FDM: form-deprivation myopia, LIM: lens-induced myopia. Data are plotted as the difference between treated and contralateral control eyes and represent the means ± standard error of the means. Sample sizes (min n=6 per group) can be found in Table 2.