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**Matlab program 1.** Quantitative analysis of kinetics of DG secretion and calcium oscillations in individual platelets

**Input:**

Txt file containing:

1. First column – time (s) (0 seconds is time of activator addition)
2. Area with granules for 1st platelet
3. Mepacrine curve for 1st platelet
4. Calcium area for 1st platelet
5. Calcium curve for 1st platelet
6. Empty column
7. Area with granules for 2nd platelet
8. Mepacrine curve for 2nd platelet
9. Calcium area for 2nd platelet
10. Calcium curve for 2nd platelet
11. Empty column
12. etc

**Output**

1. 3 graph (.tif) files: mepacrine curve, calcium curve (with baseline curve) and both mepacrine and calcium curve with 1st release event marked
2. Txt file called as “experimental\_trial\_plt\_№” which contains the following:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Name of plt | level of calcium baseline | Absolute level of Calcium baseline | average level of Ca spikes | time of first release event start | duration of first release event | amplitude of first release event | number of the recent peak (from beginning of measurement) | number of the recent peak (after activation) | calcium frequency before activation | calcium frequency after activation | average calcium peak value before activation | average calcium peak value after activation (before release) | calcium integral before release event (full) | calcium integral before release event (after activation) | calcium integral at release ( averaged by 3 frames before release event) | calcium integral at release ( averaged by 5 frames before release event) | calcium integral at release ( averaged by 10 frames before release event) | calcium integral at release ( averaged by 20 frames before release event) | amplitude of calcium peak preceding release | time of calcium peak preceding release | Time between first release event and preceding calcium peak | number of granule release events | platelet type (spread or non-spread) | platelet area (mepacrine) | platelet area (calcium) |

1. Txt file with more detailed Calcium parameters (called as “spikes\_data\_new\_№\_plt”)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **#** | 1 | 2 | 3 | 4 | 5 | 6 |
| Platelet name | level of calcium baseline | Absolute level of Calcium baseline | number of granule release events | platelet type (spread or non-spread) | platelet area (mepacrine) | platelet area (calcium) |
| Number of peak | Time of Calcium peak | Amplitude of Calcium peak | Current Calcium integral |  |  |  |

1. Txt file with Bootstrap modeling on this platelet calcium curve, called as “spike\_data\_random\_secretion\_plt\_№”

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **#** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** |
| Platelet name | pseudo-release time | recent peak time | Time to the preceding spike | Calcium peak value | current value (in the moment of release) of full calcium integral from the activator additon | calcium integral at release ( averaged by 3 frames before release) | Calcium integral at release ( averaged by 5 frames before release) | calcium integral at release ( averaged by 10 frames before release) | calcium integral at release ( averaged by 20 frames before release) |

1. Txt file with integral profiles, called as “integrated\_calcium\_profiles\_full\_plt\_№”, with full integrated calcium profiles for windows of 3, 5, 10 and 20 time frames (1.5, 2.5, 5, 10 seconds).