**SUPPLEMENTAL MATERIAL**

# Succinate ester derivative of δ-tocopherol enhances the protective effects against $^{60}$Co γ-ray-induced hematopoietic injury through granulocyte colony-stimulating factor induction in mice

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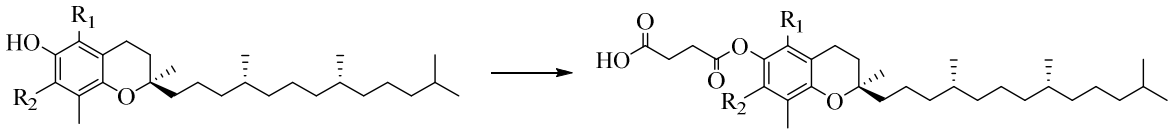
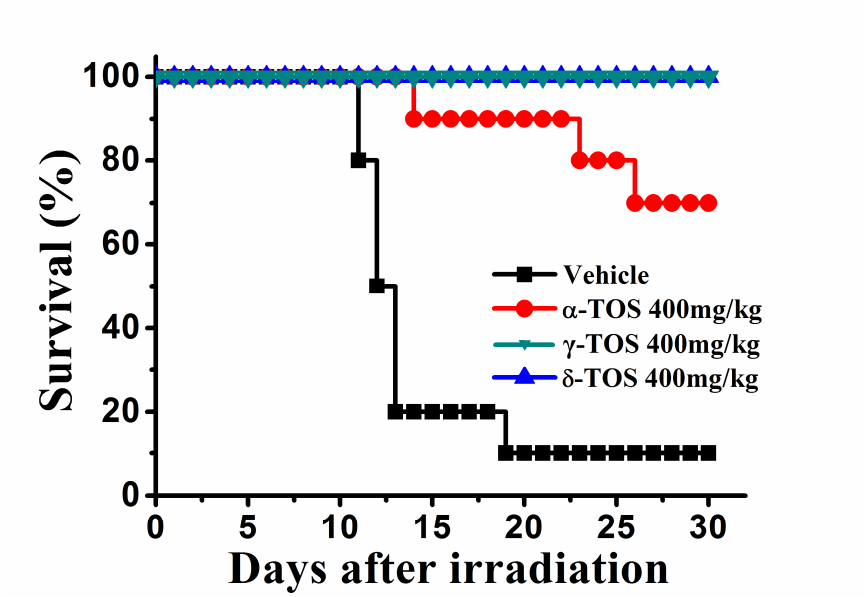



α -TOS: $R_1$=methyl; $R_2$=methyl
γ -TOS: $R_1$=H; $R_2$=methyl
δ -TOS: $R_1$=H; $R_2$=H

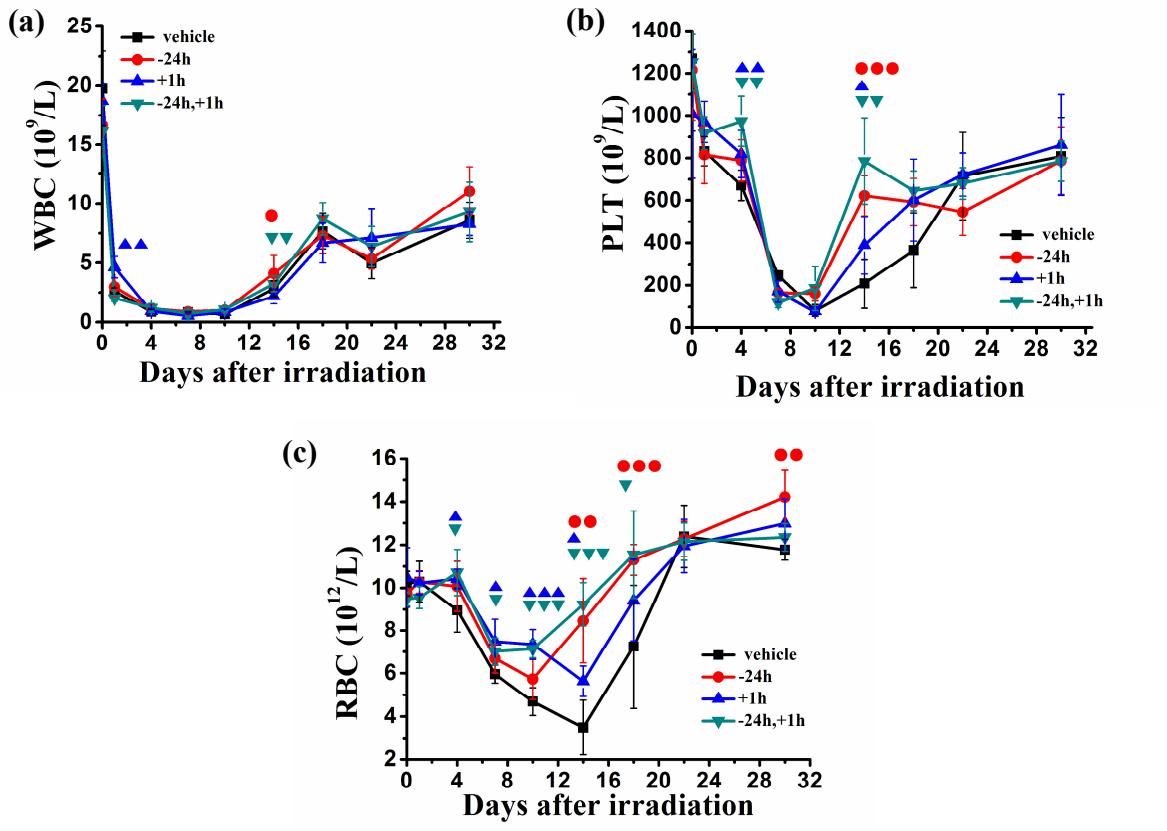
Reagents and conditions: Succine anhydride, hexane, TEA, refluxing, 10h, 85-94%.

**Supplemental Figure 1. syntheses of tocopherol succinates**

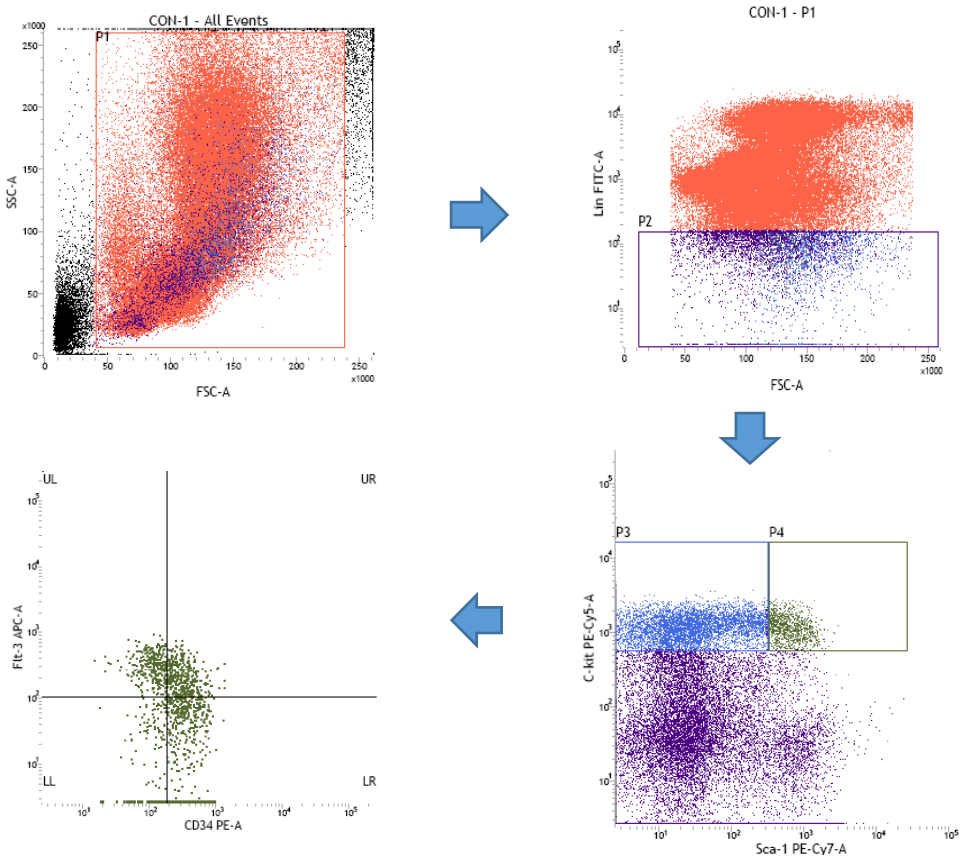



**Supplemental Figure 2. Tocopherol derivatives protected mice from the 9.0 Gy TBI.**

Kaplan-Meier survival rate curve of 4 groups (n=10) respectively administrated with PEG400 (vehicle), α-TS (400 mg/kg), γ-TOS (400 mg/kg) and δ-TOS (400 mg/kg) 24 h before and 1 h after the 9.0 Gy TBI. *P* value was calculated by log-rank test.



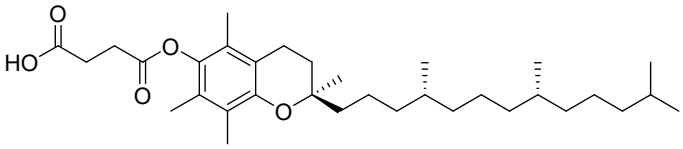

**Supplemental Figure 3. Radioprotection and mitigation of δ-TOS against radiation induced hematopoietic injury.** (**a**) The white blood cells count, (**b**) the platelets count, (**c**) the red blood cells count in 30 days after the 6.5 Gy TBI of 3 groups (n=8) respectively administrated with δ-TOS (100 mg/kg) 24 h before, 1 h after, and 24 h before & 1 h after the irradiation. The control group was administrated with PEG400 (vehicle) 24 h before & 1 h after the irradiation. Data represent the mean±S.E.M. (n=8); ●P, ▲P, ▼P<0.05; ●●P , ▲▲P,▼▼P＜0.01; ●●●P , ▲▲▲P, ▼▼▼P< 0.001 *vs.* control (vehicle) group.




**Supplemental Figure 4. Flow cytometric assays of hematopoietic stem and progenitor cell of mouse bone marrow cells**

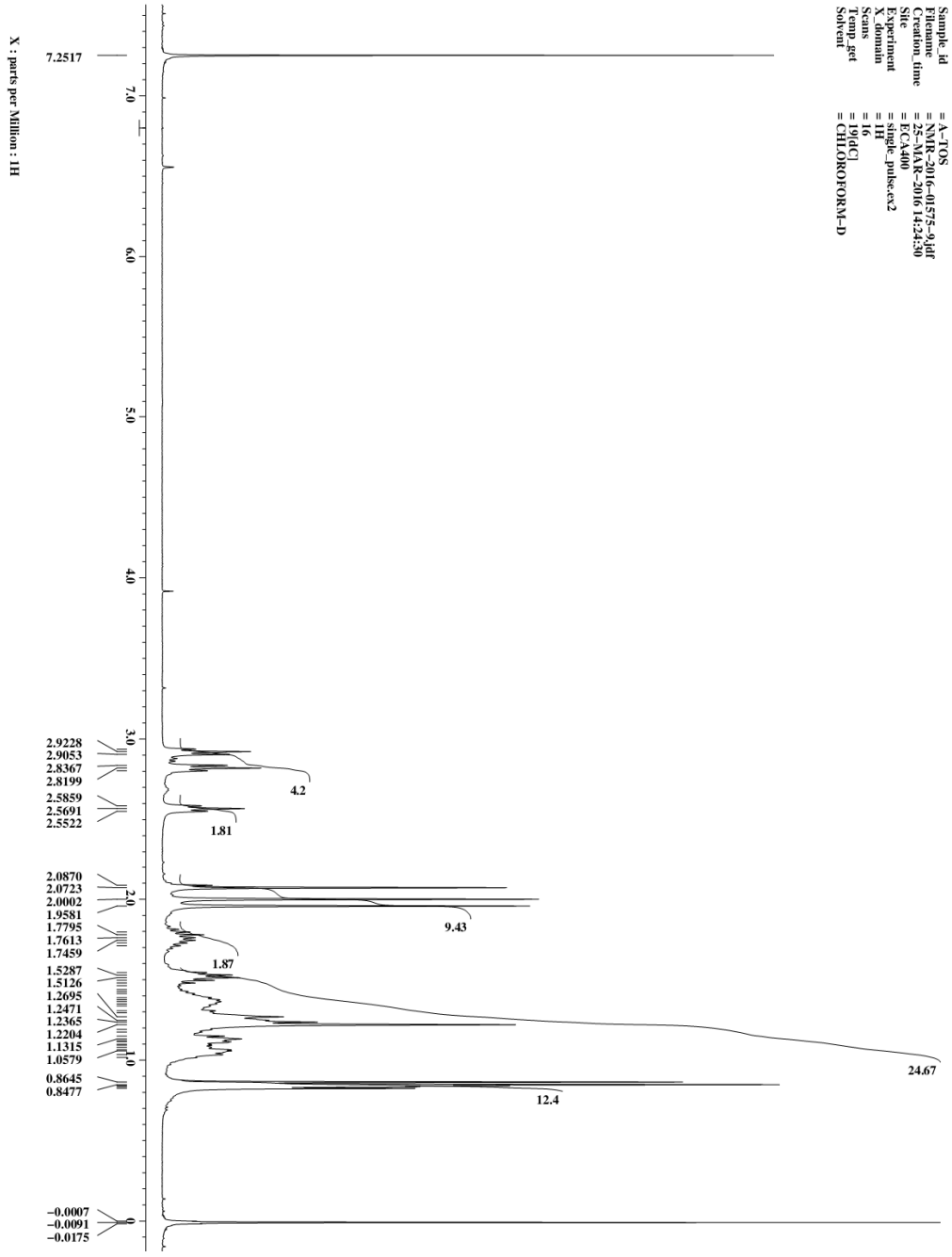
**Supplemental Figure 5.**

α-TOS



Chemical Formula: $C_{33}H_{54}O_5$
Molecular Weight: 530.79

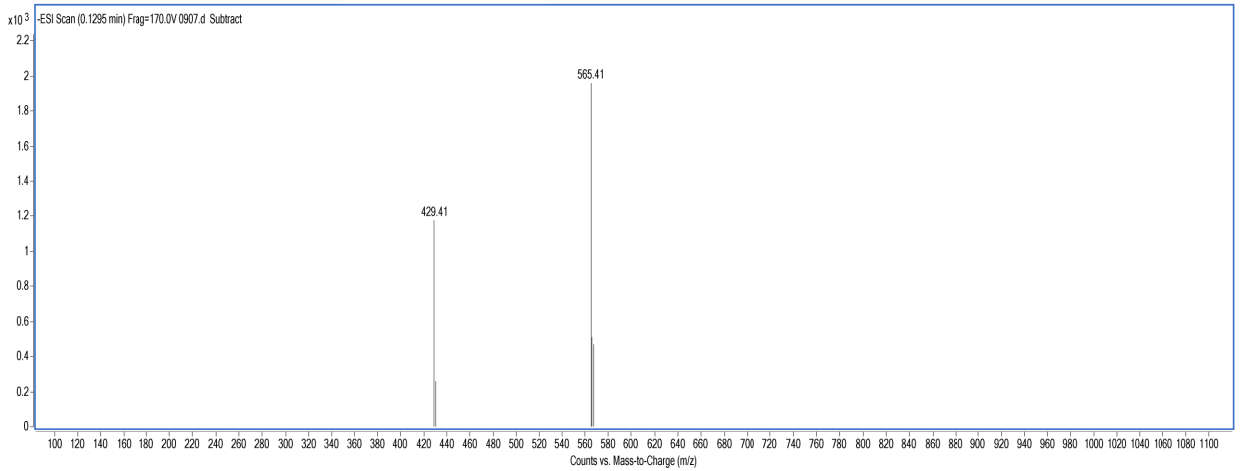
$H^1$-NMR



# Qualitative Analysis Report

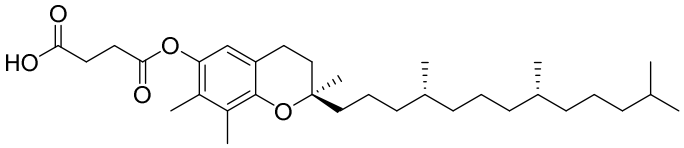
| | | | |
|---|---|---|---|
| **Data Filename** | 0907.d | **Sample Name** | A-TOS |
| **Instrument Name** | TOF G6230A | **Acquired Time** | 2016-03-25 |
| **Acq Method** | YCL.M | **Acquired SW** | 6200 series TOF/6500 series |
| **IRM Calibration Status** | **Success** | | |

**User Chormatograms**



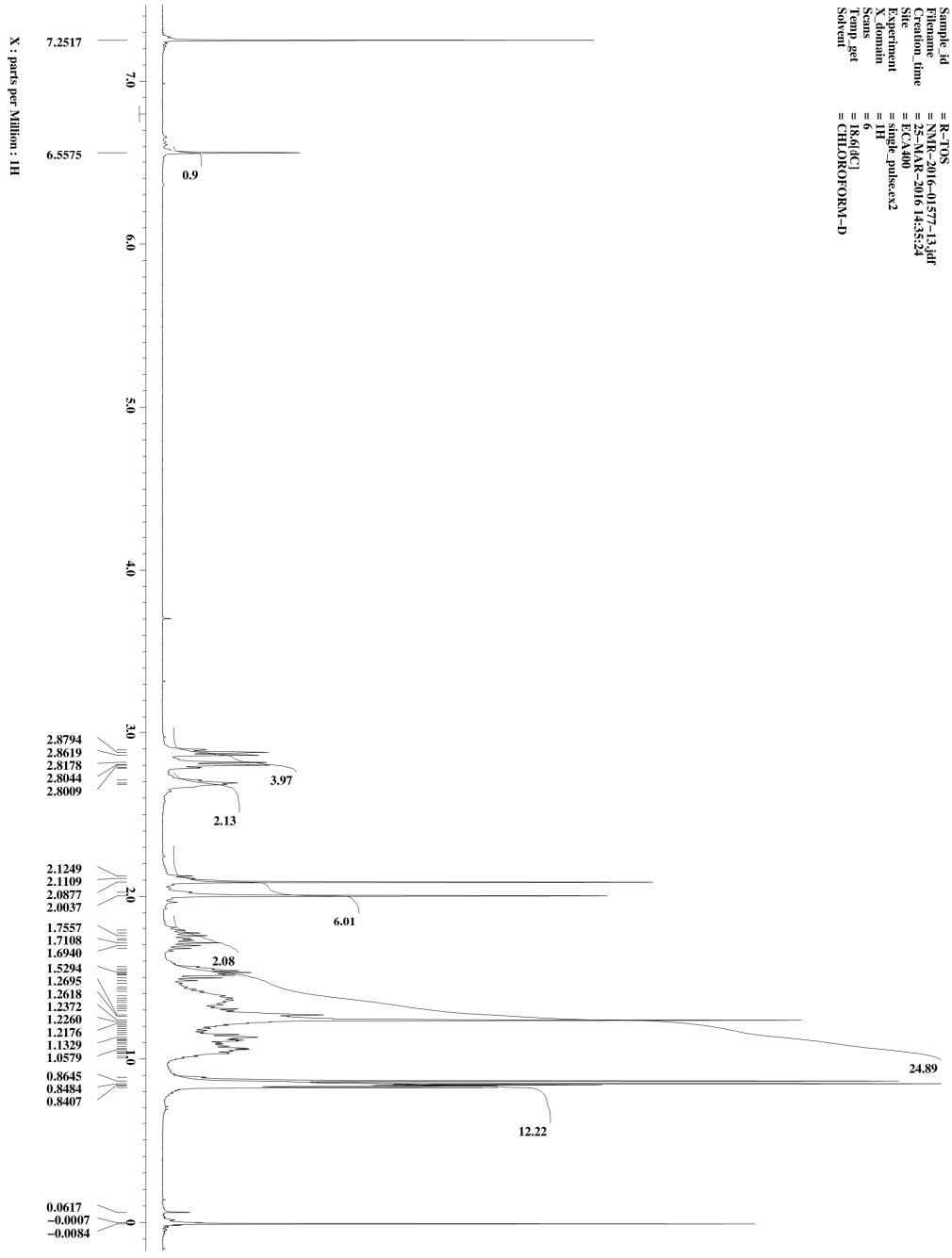

HPLC-MS

γ-TOS



Chemical Formula: $C_{32}H_{52}O_5$
Molecular Weight: 516.76

$H^1$-NMR

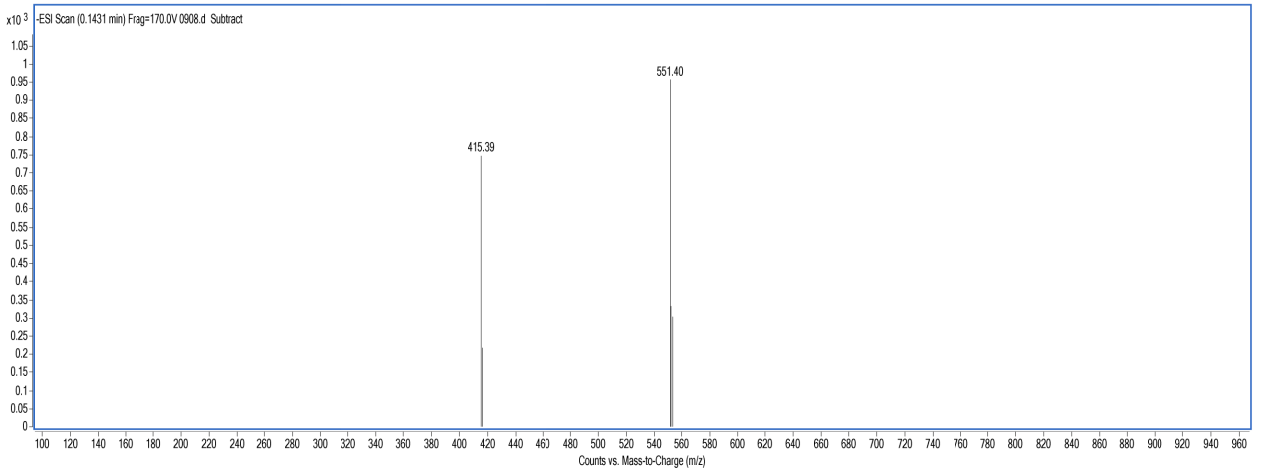


HPLC-MS

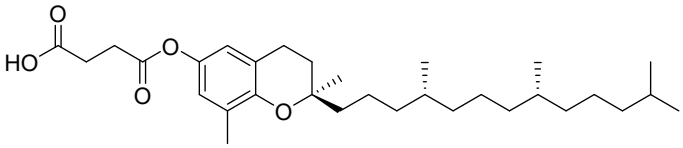
# Qualitative Analysis Report

| | | | |
|---|---|---|---|
| **Data Filename** | 0908.d | **Sample Name** | R-TOS |
| **Instrument Name** | TOF G6230A | **Acquired Time** | 2016-03-25 |
| **Acq Method** | YCL.M | **Acquired SW** | 6200 series TOF/6500 series |
| **IRM Calibration Status** | **Success** | | |

**User Chormatograms**

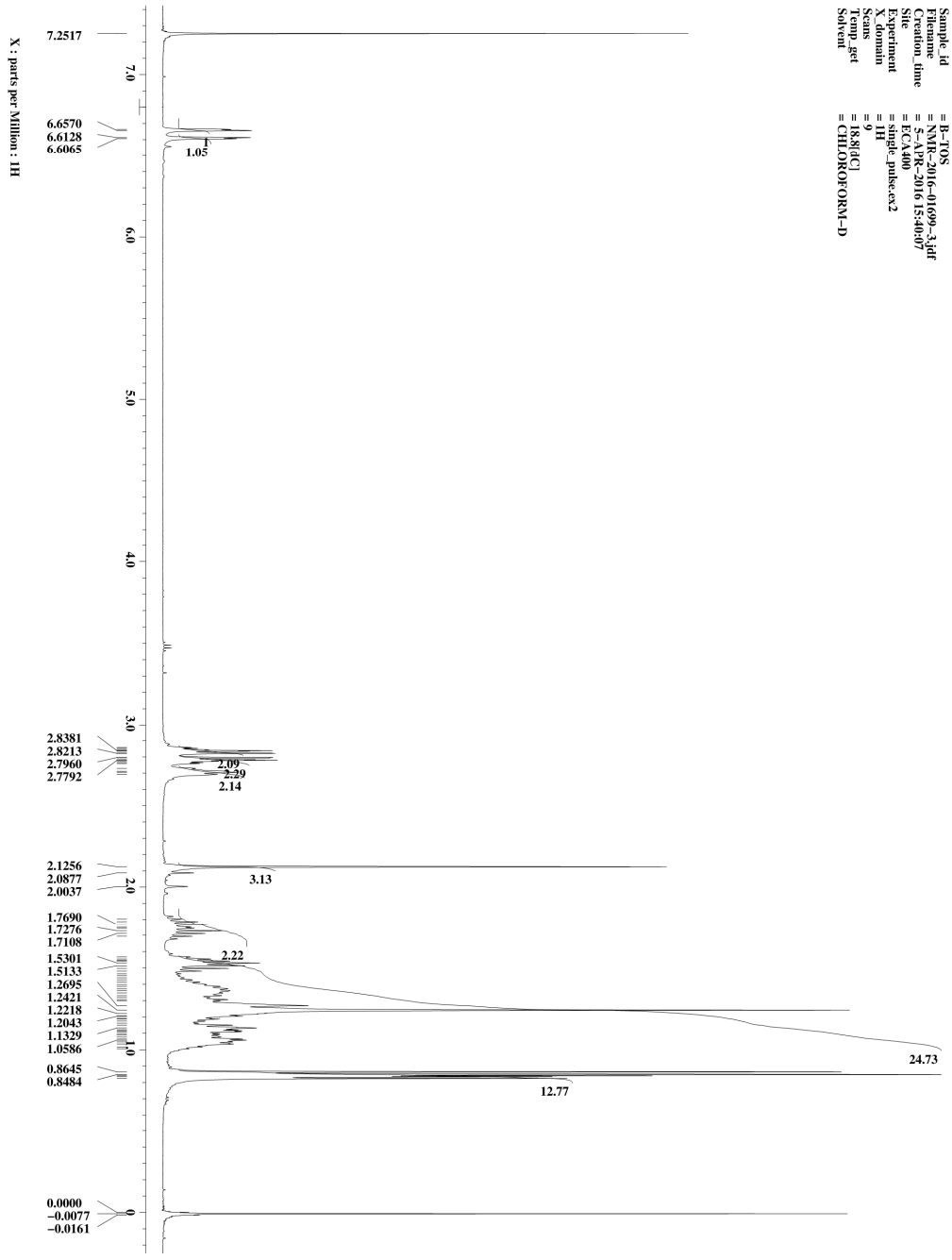


δ-TOS

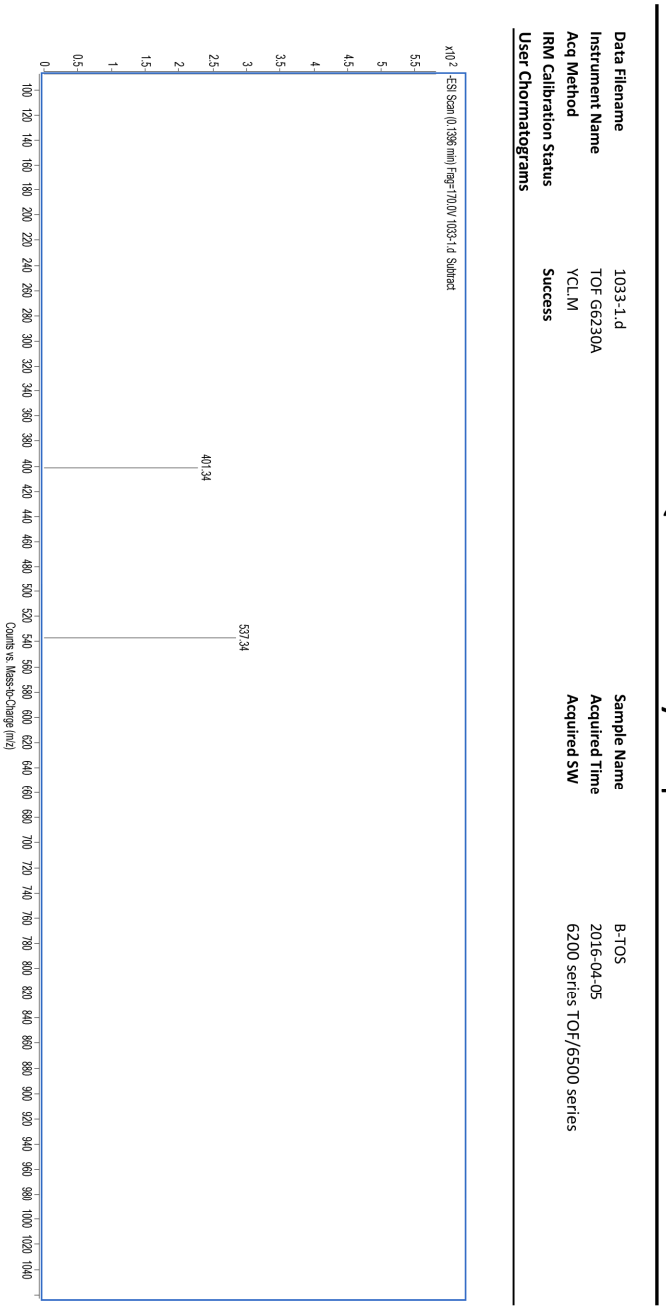


Chemical Formula: $C_{31}H_{50}O_5$
Molecular Weight: 502.74

$H^1$-NMR



δ-TOS HPLC-MS




**Supplemental Figure 5.** HPLC-MS and δ-TOS $H^1$-NMR