Additional explanation to the UPOs applied:

*Aae*UPO – main abundant UPO of *Agrocybe aegerita*
*Cab*MQ II – acidic UPO of *Candolleomyces aberdarensis*
*Cab*MSII – neutral UPO of *Candolleomyces aberdarensis*
*Cca*MQ2 – acidic UPO of Candolleomyces candolleana (Vietnam)
*Ceu*MQ5 – acidic UPO of *Candolleomyces eurysporus*
*Ceu*MS3 – neutral UPO of *Candolleomyces eurysporus*
*Cgl*UPO – main abundant UPO of *Chaetomium globosum*
*Cra*UPO – main abundant UPO of *Coprinellus radians*
*Mro*UPO – main abundant UPO of *Marasmius rotual*
*Mwe*UPO – main abundant UPO of *Marasmius wettsteinii*
r*Cab*2UPO – recombinant acidic UPO of *Candolleomyces aberdarensis*
r*Cab*1UPO – recombinant acidic UPO of *Candolleomyces aberdarensis*

Supplemental Figures and Tables referring to results part:

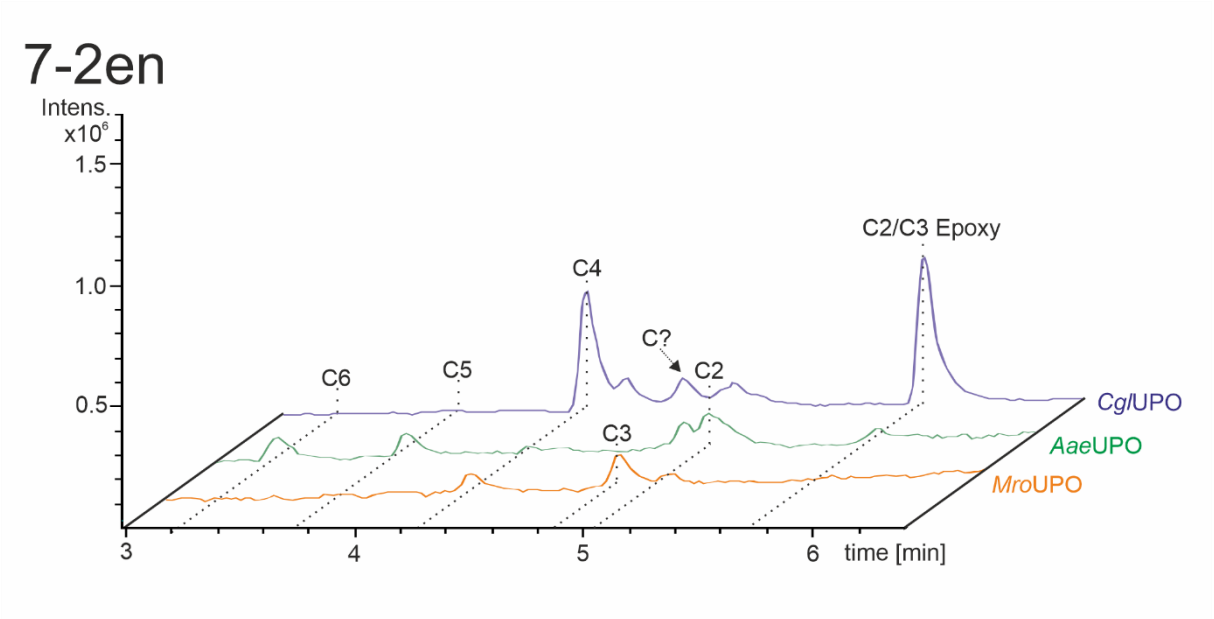

Figure S1a. MS-Chromatograms of reaction setups including 2-heptenoic acid and three different UPOs (*Cgl*UPO, *Aae*UPO and *Mro*UPO).

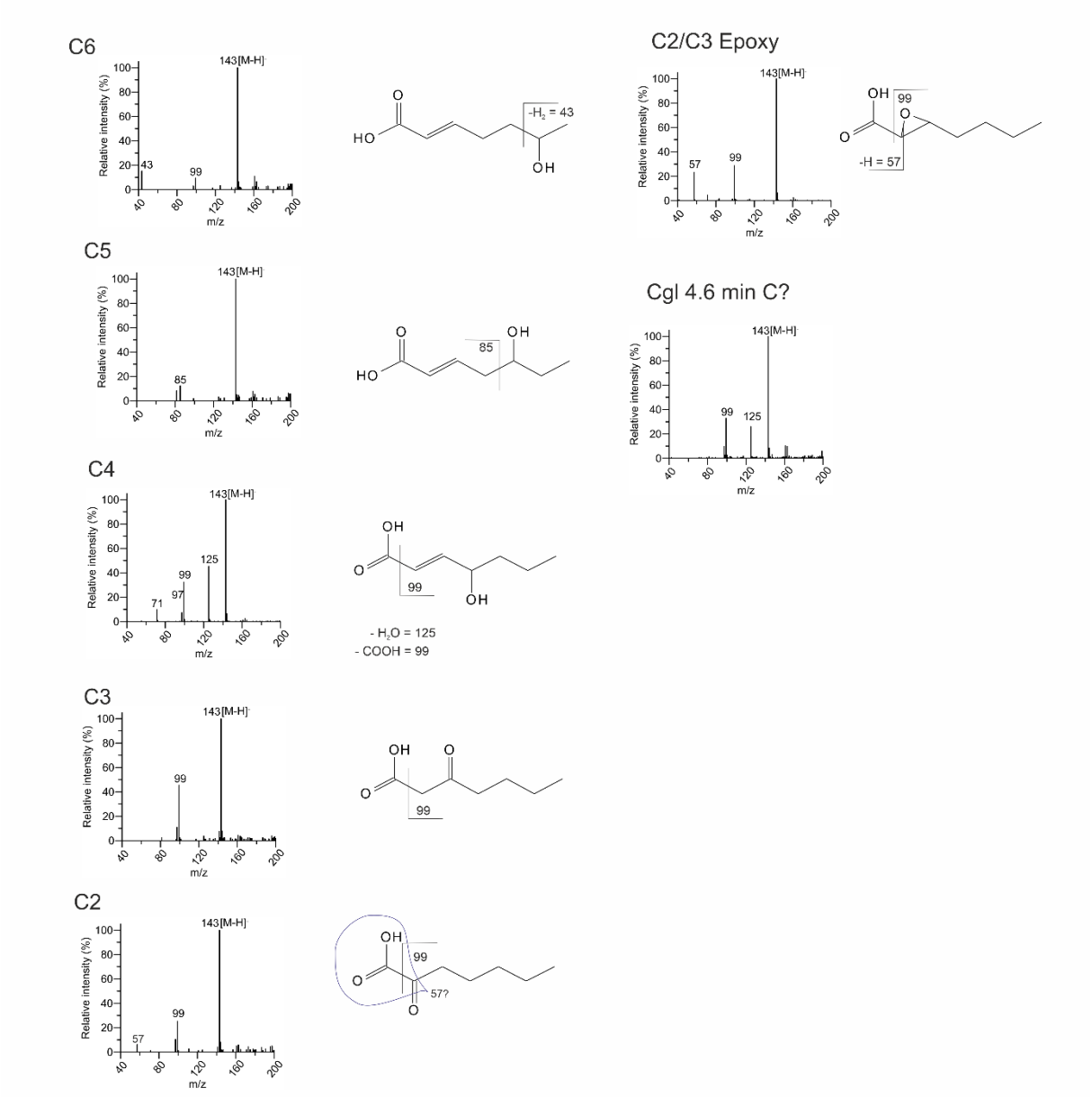

Figure S1b. MS-fragmentation patterns of products deriving from 2-heptenoic acid

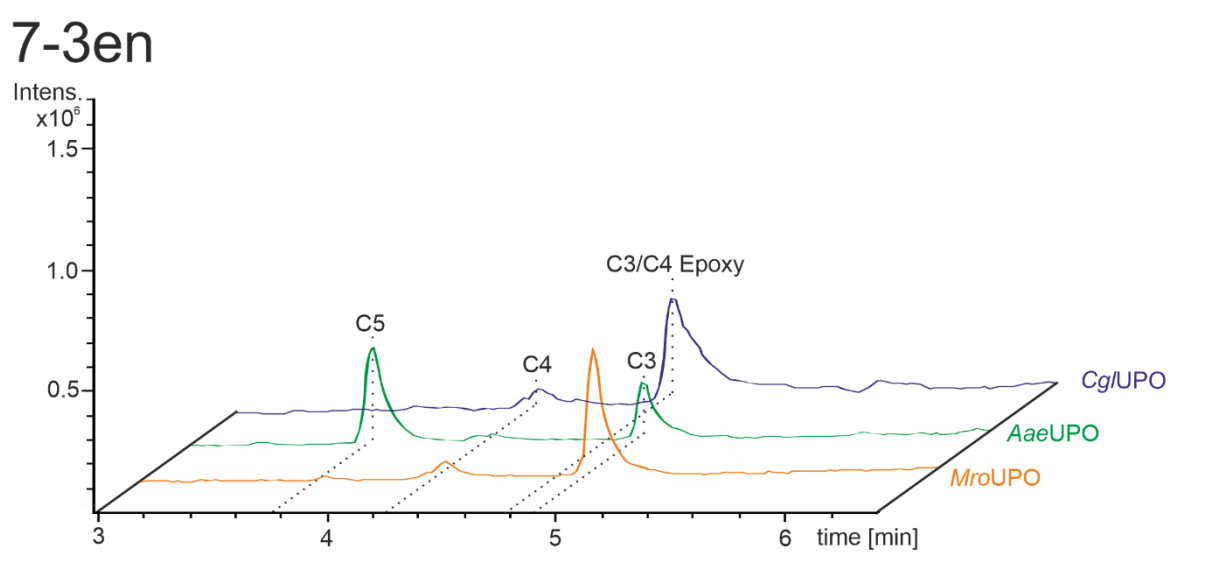

Figure S2a. MS-Chromatograms of reaction setups including 3-heptenoic acid and three different UPOs (*Cgl*UPO, *Aae*UPO and *Mro*UPO).

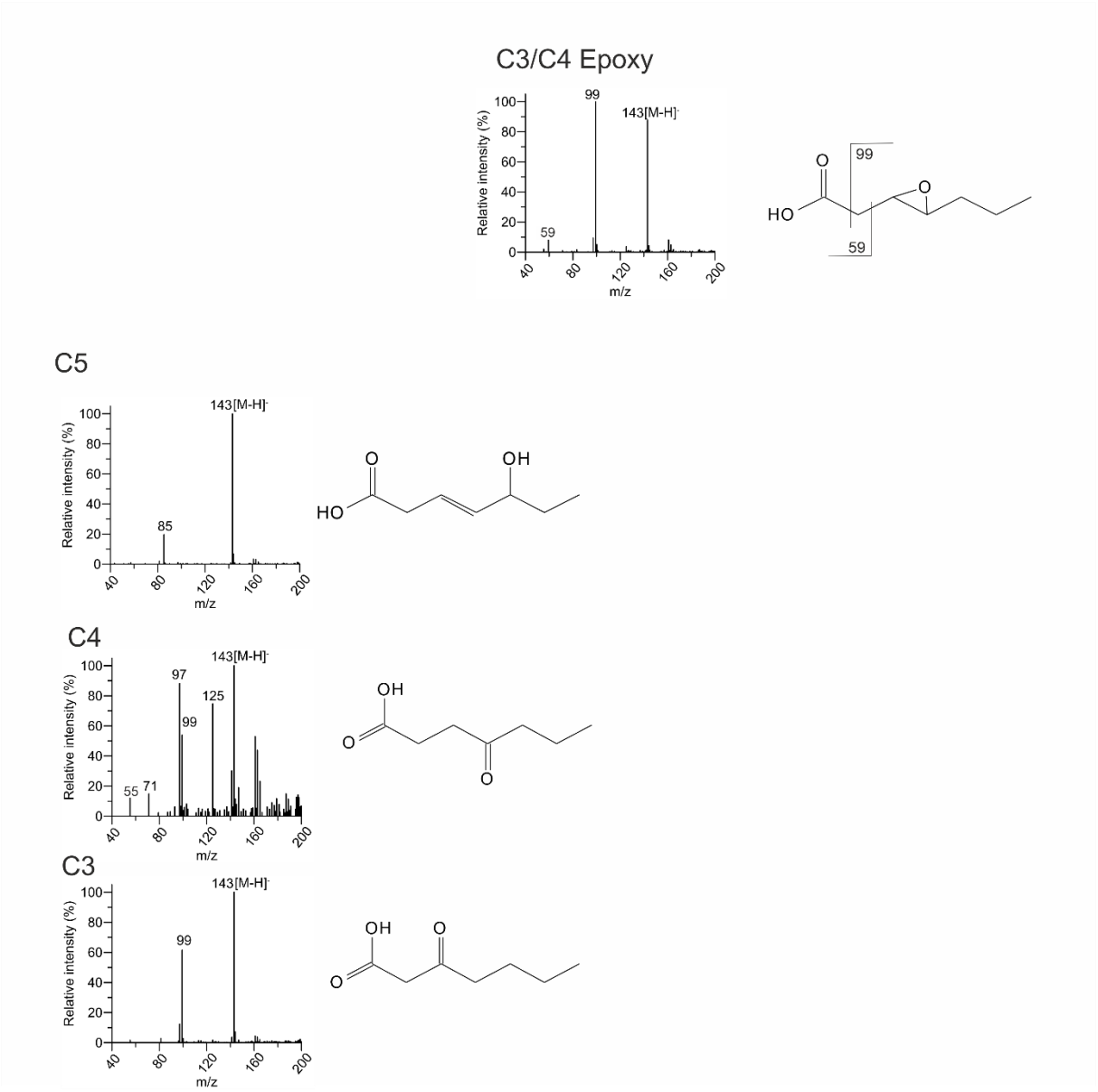

Figure S2b: MS-fragmentation patterns of products deriving from 3-heptenoic acid

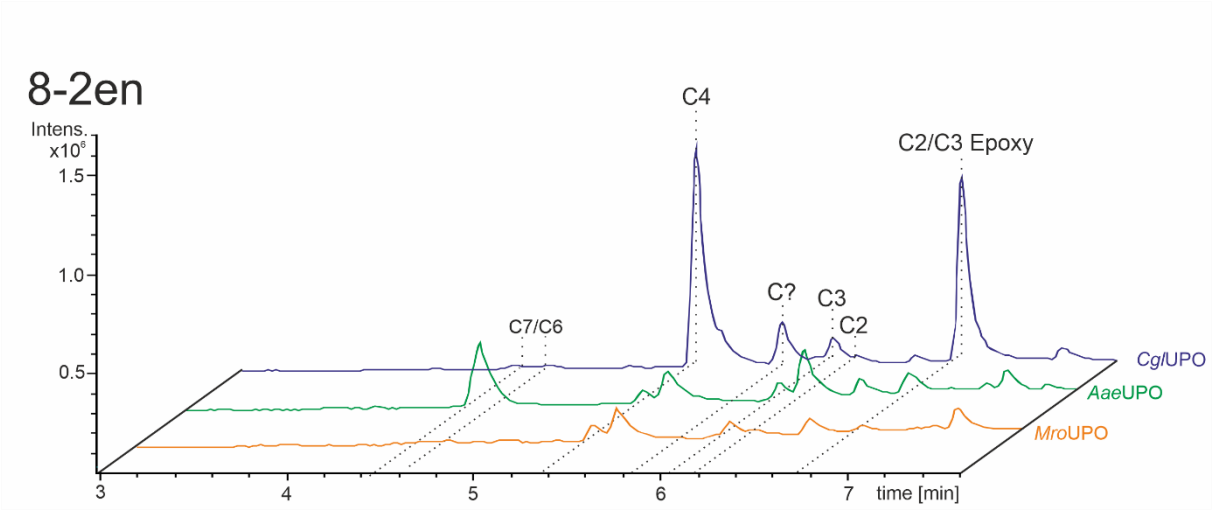

Figure S3a. MS-Chromatograms of reaction setups including 2-octenoic acid and three different UPOs (*Cgl*UPO, *Aae*UPO and *Mro*UPO).

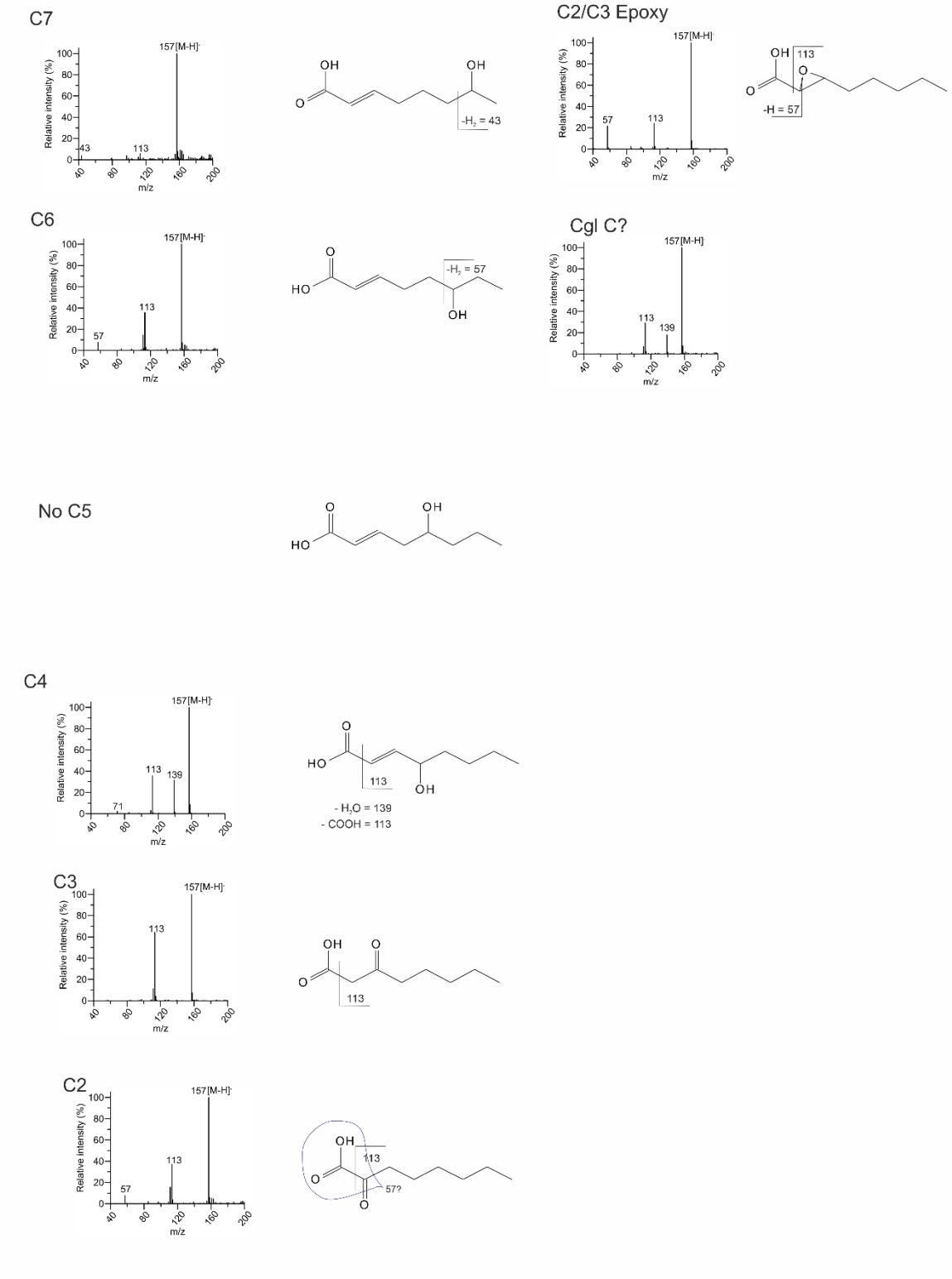

Figure S3b. MS-fragmentation patterns of products deriving from 2-octenoic acid

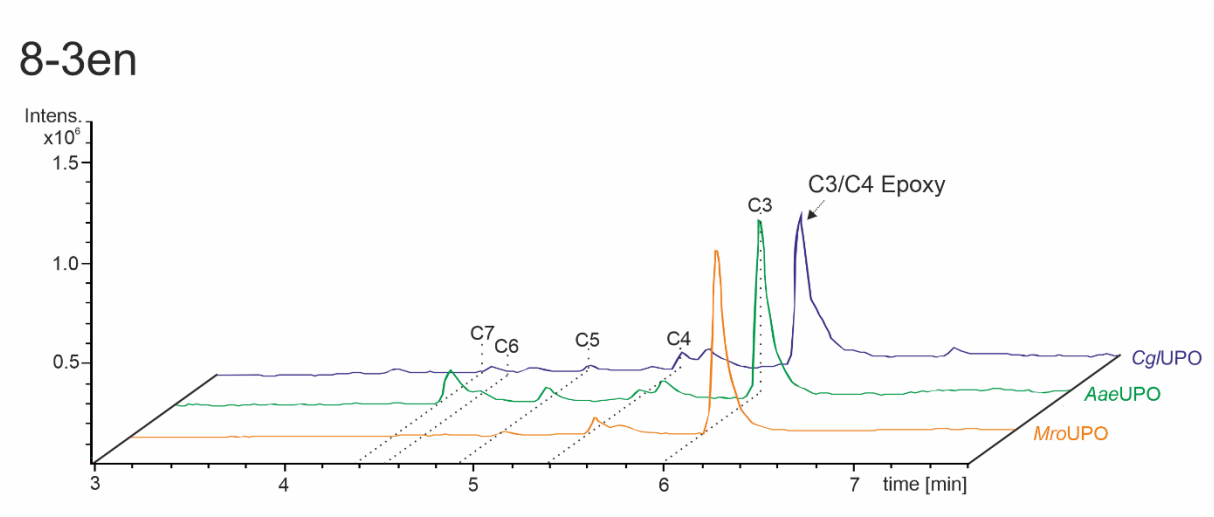

Figure S4a. MS-Chromatograms of reaction setups including 3-octenoic acid and three different UPOs (*Cgl*UPO, *Aae*UPO and *Mro*UPO).

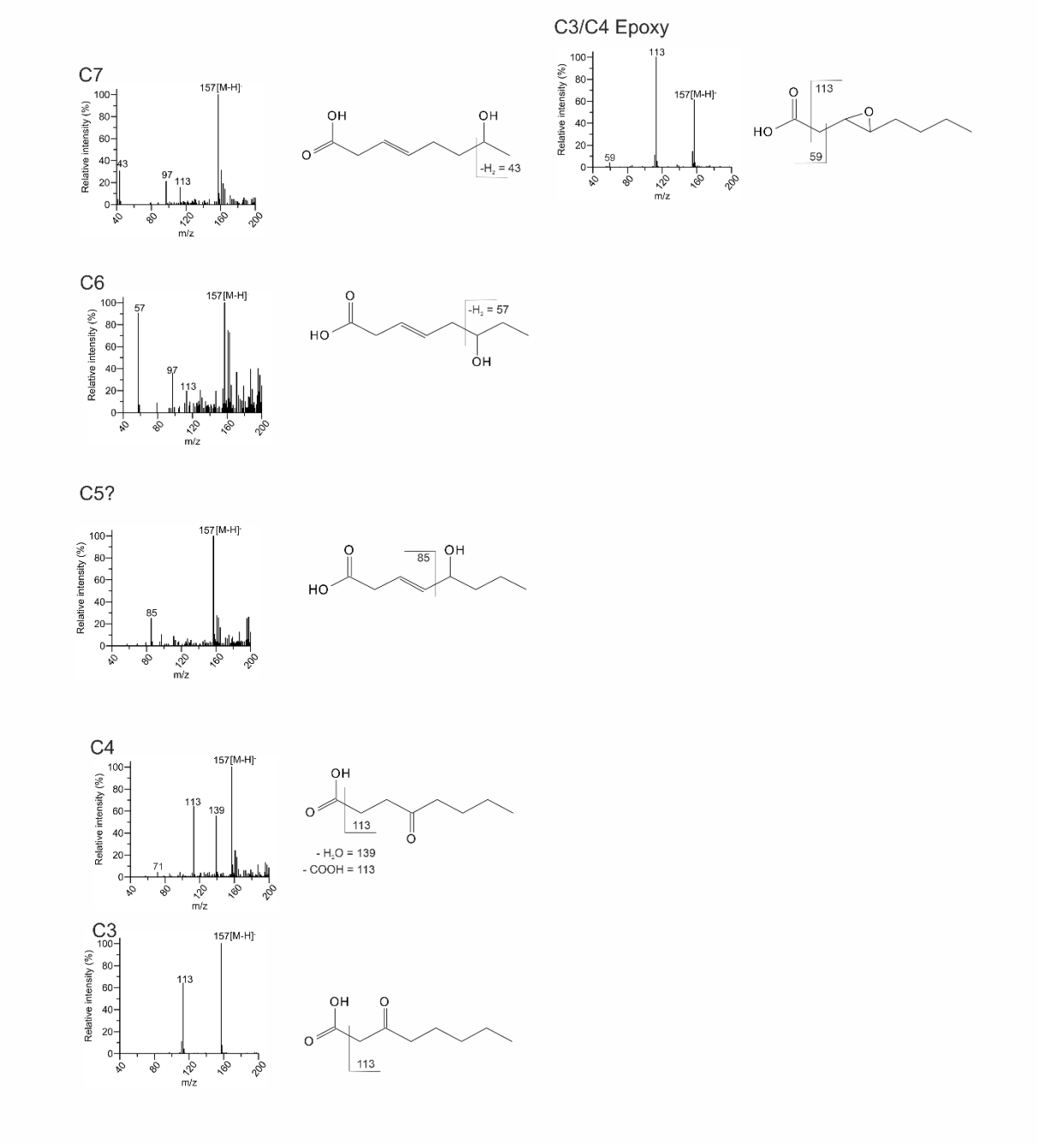

Figure S4b. MS-fragmentation patterns of products deriving from 3-octenoic acid.

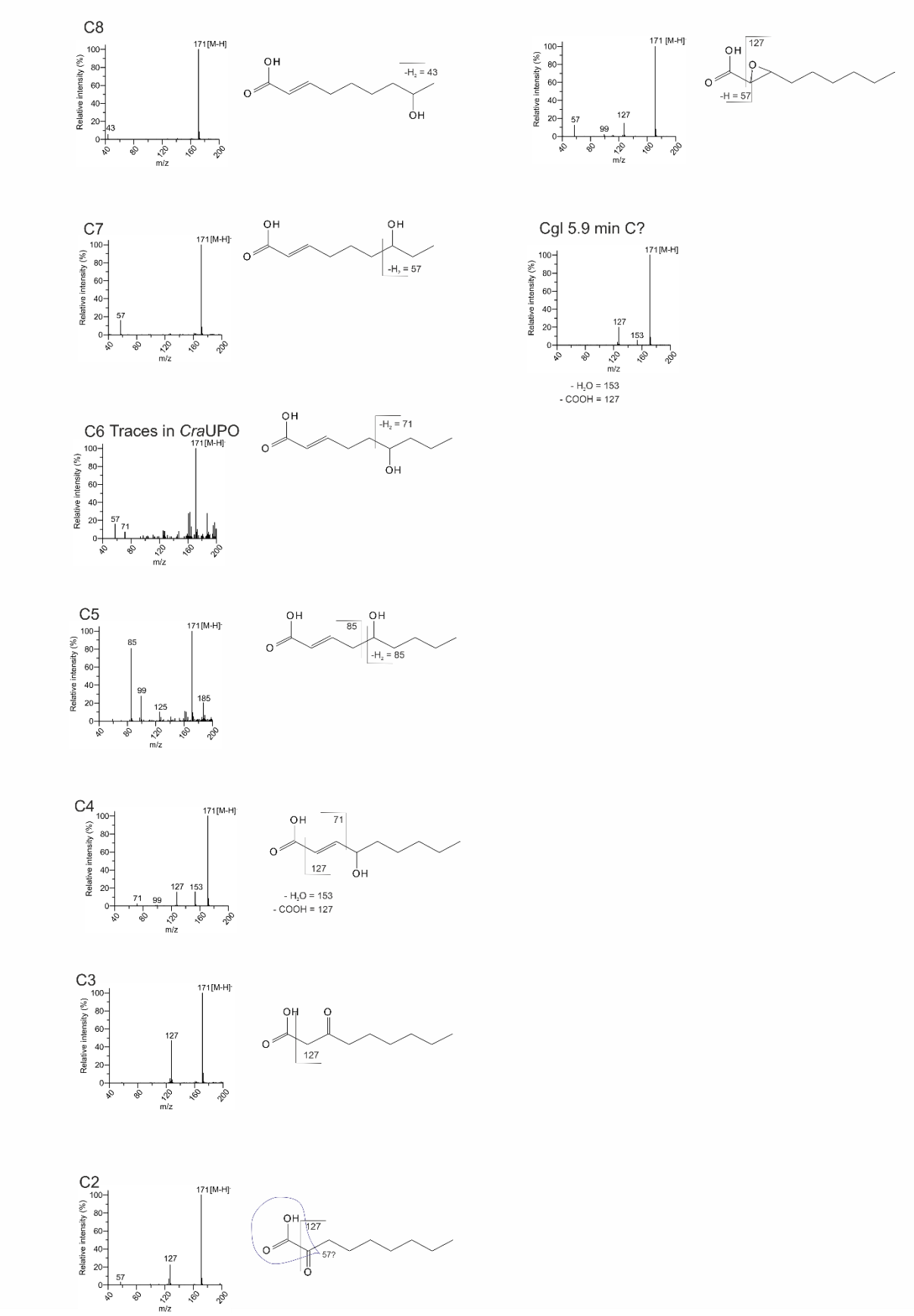

Figure S5. MS-fragmentation patterns of products deriving from 2-nonenoic acid.

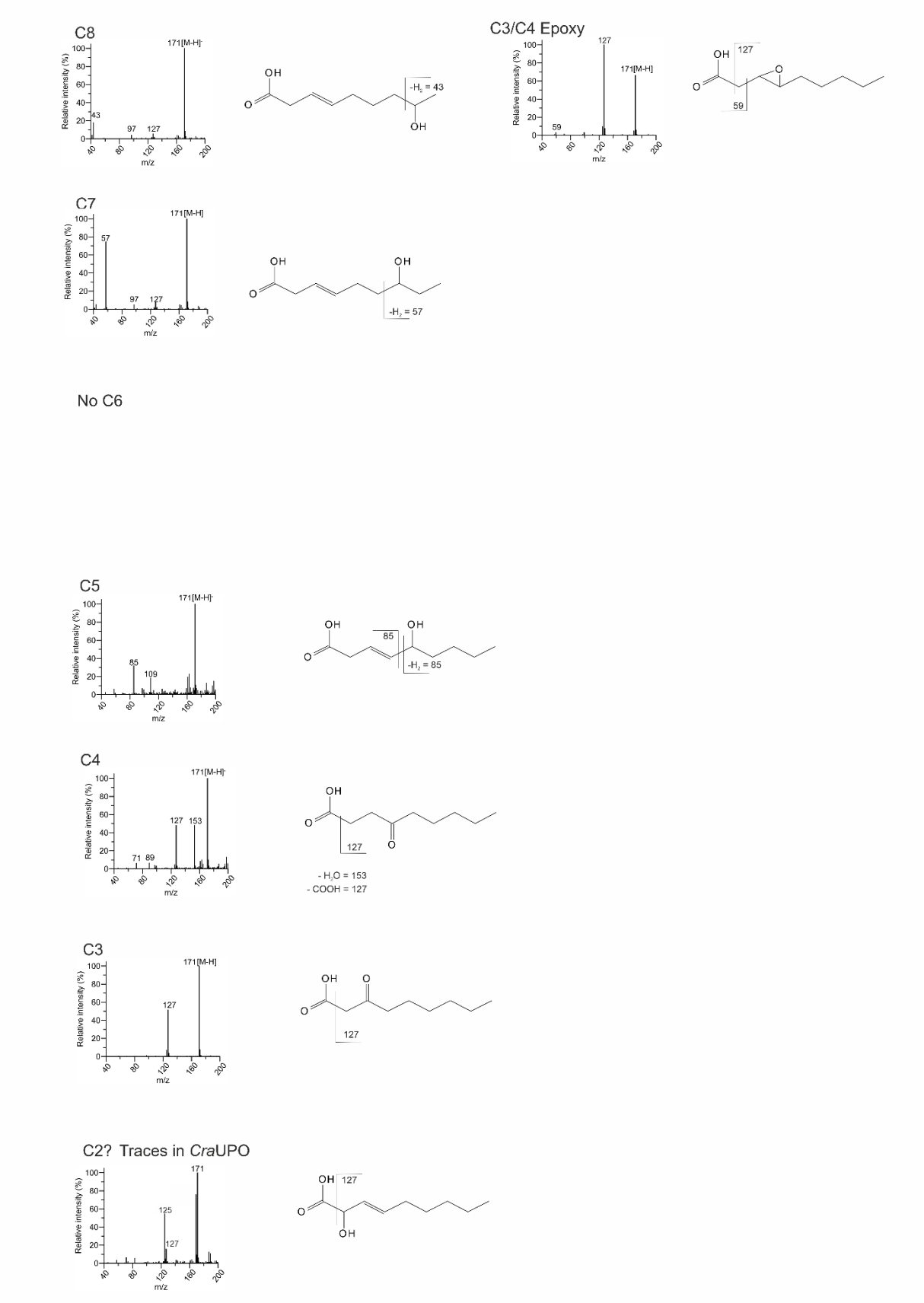

Figure S6. MS-fragmentation patterns of products deriving from 3-nonenoic acid.

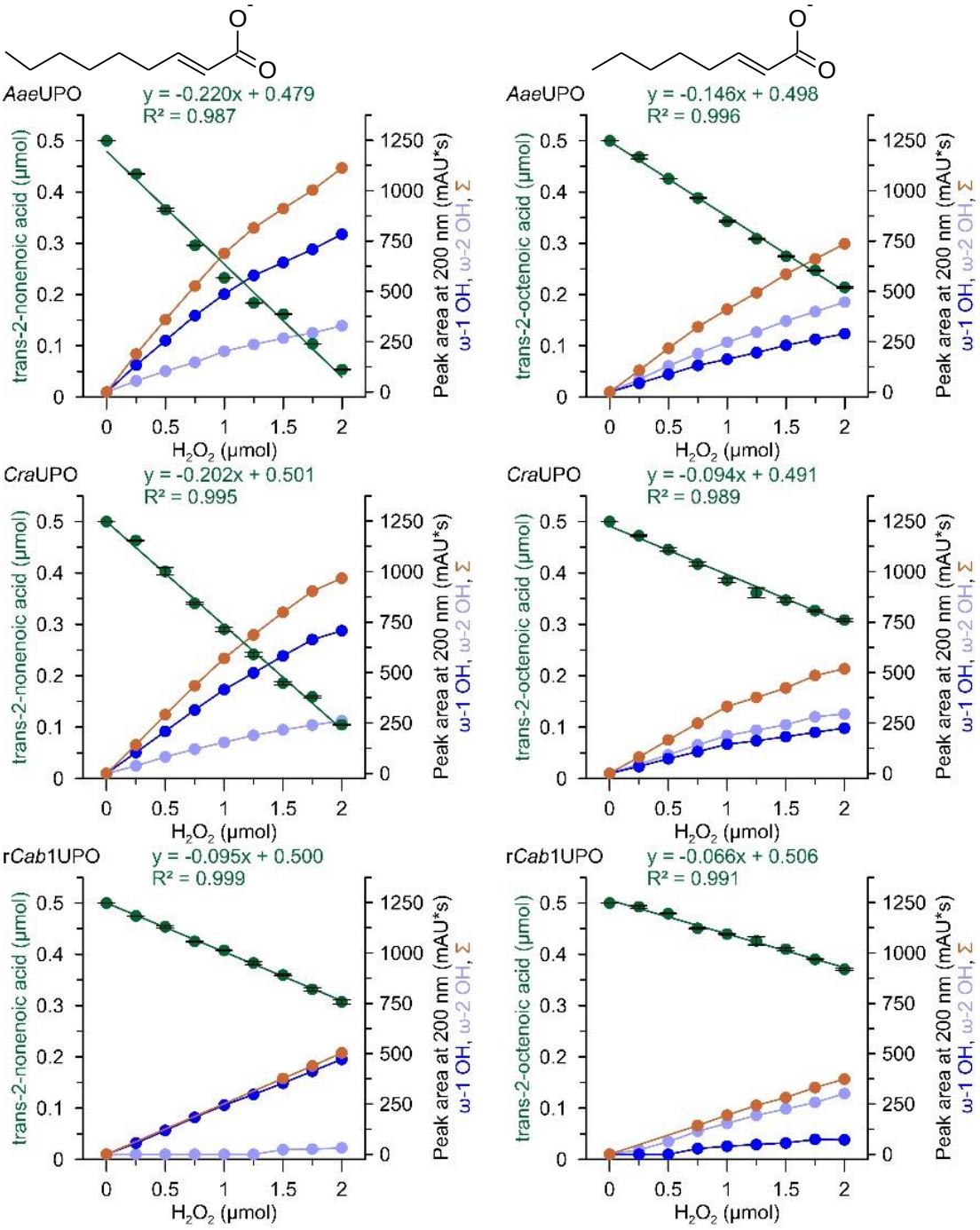

Figure S7: Amount of residual trans-2-nonenoic acid (t-C9-2-en, left, green) or trans-2-octenoic acid (t-C8-2-en, right, green), as well as peak areas (relative for each product only) of the corresponding ω-1 (dark blue) and ω-2 (light blue) hydroxy products or further UV-absorbing products after different amount of H_2O_2 dosage (orange represents the sum of both products). For MS-based product quantification refer to Tables 5 and 6.

Reaction setup: 0.5 µmol t-C9-2-en and t-C8-2-en, UPO 0.5 U (Valc), 10 mM KP_i pH 6 and 10% acetone. Formulas refer to the initial conversion rates of FA in µmol [C9-2-en]/µmol [H_2O_2]

Conclusion: Continuous conversion of FA - TON was not reached under the conditions tested.

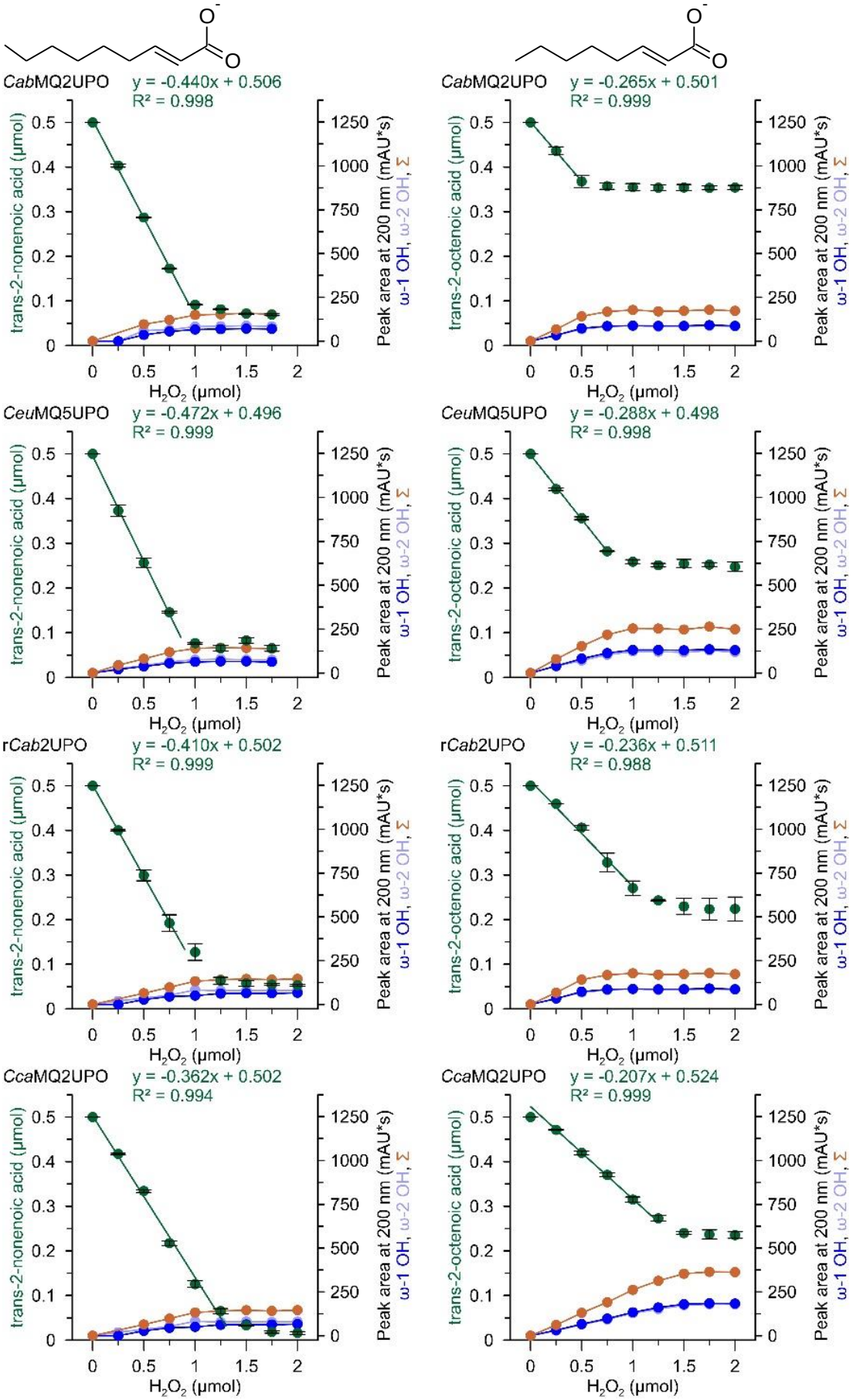

Figure S8. Amount of residual trans-2-nonenoic acid (t-C9-2-en, left, green) or trans-2-octenoic acid (t-C8-2-en, right green), as well as peak areas (relative for each product only) of the corresponding ω-1

(dark blue) and ω-2(light lue) hydroxy products or further UV-absorbing products after different amount of H_2O_2 dosage (orange represents the sum of both products). For MS-based product quantification refer to Tables 5 and 6.
Reaction setup: 0.5 µmol t-C9-2-en and t-C8-2-en, UPO 0.5 U (Valc), 10 mM KP_i pH 6 and 10% acetone.
Formulas refer to the initial conversion rates of FA in µmol [C9-2-en]/µmol [H_2O_2]
Conclusion: Nearly "completed" conversion of FA C9-2en – but not in case of C8-2en.

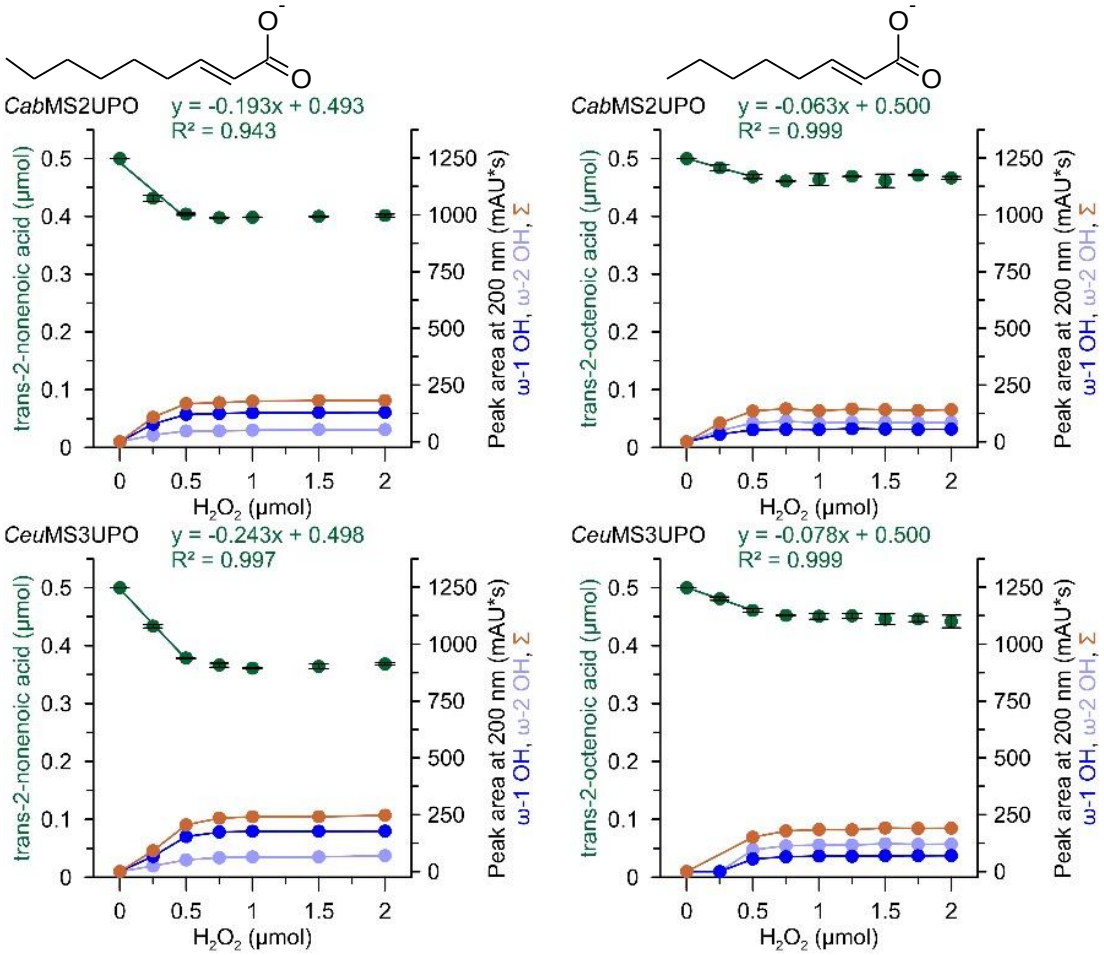

Figure S9. Amount of residual trans-2-nonenoic acid (t-C9-2-en, left green) or trans-2-octenoic acid (t-C8-2-en, right, green), as well as peak areas (relative for each product only) of the corresponding ω-1 (dark blue) and ω-2 (light blue) hydroxy products or further UV-absorbing products after different amount of H_2O_2 dosage (orange represents the sum of both products). For MS-based product quantification refer to Tables 5 and 6.
Reaction setup: 0.5 µmol t-C9-2-en and t-C8-2-en, UPO 0.5 U (Valc), 10 mM KP_i pH 6 and 10% acetone.
Formulas refer to the initial conversion rates of FA in µmol [C9-2-en]/µmol [H_2O_2]
Conclusion: "incomplete" conversion of FA - TON was reached.

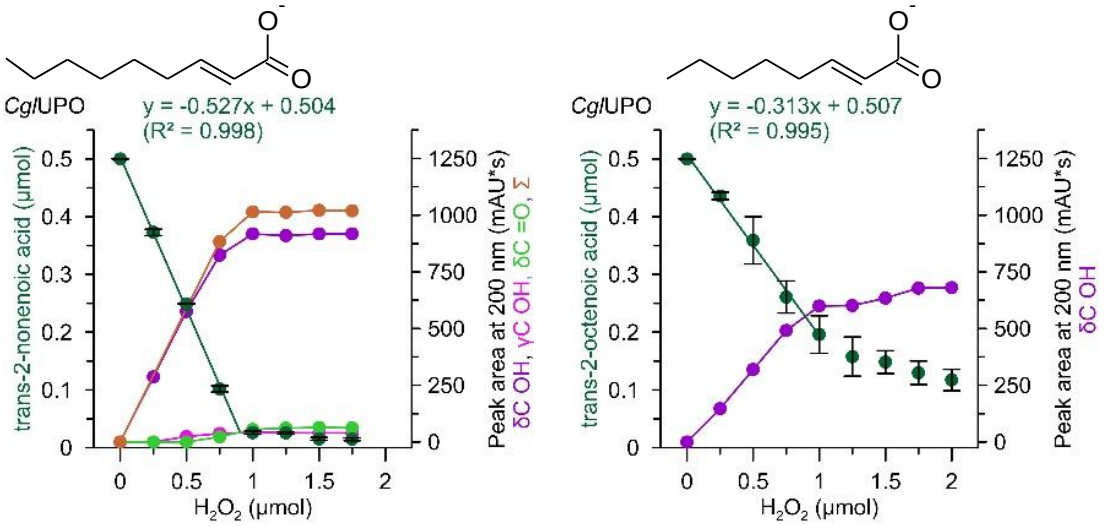

Figure S10. Amount of residual trans-2-nonenoic acid (t-C9-2-en, left, green) or trans-2-octenoic acid (t-C8-2-en, right, green), as well as peak areas (relative for each product only) of the corresponding tentatively identified products after different amount of H_2O_2 dosage (δ-hydroxy violet, γ-hydroxy pink, δ –keto green, sum of products, orange). For MS-based product quantification refer to Tables 5 and 6.

Reaction setup: 0.5 µmol t-C9-2-en and t-C8-2-en, UPO 0.5 U (Valc), 10 mM KP_i pH 6 and 10% acetone. Formulas refer to the initial conversion rates of FA in µmol [C9-2-en]/µmol [H_2O_2]

Conclusion: "complete" conversion of FA in case of C9-2en; but TON was reached for C8-en2

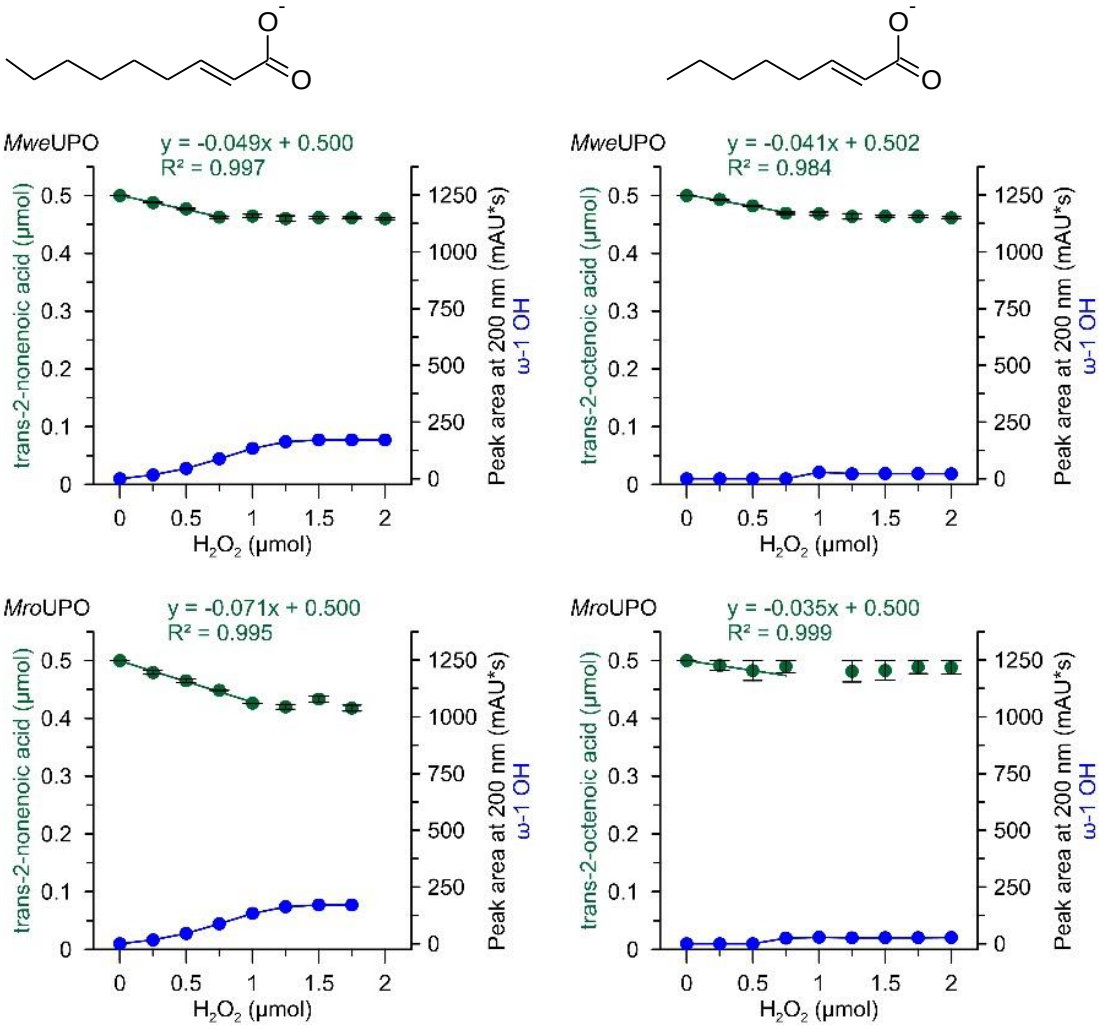

Figure S11. Amount of residual trans-2-nonenoic acid (t-C9-2-en, left, green) or trans-2-octenoic acid (t-C8-2-en, right, green), as well as peak areas (relative for each product only) of the corresponding ω-1 product (dark blue) after different amount of H_2O_2 dosage. For MS-based product quantification refer to Tables 5 and 6.
Reaction setup: 0.5 µmol t-C9-2-en and t-C8-2-en, UPO 0.5 U (Valc), 10 mM KP_i pH 6 and 10% acetone.
Formulas refer to the initial conversion rates of FA in µmol [C9-2-en]/µmol [H_2O_2]
Conclusion: Relatively "low" conversion

Table S1. additional, numeric data for table 2, rel. product yield with 3-nonenoic acid and various UPOs – product in %, apparently identified according to MS-ionization.

	C2-OH	C3-OH	3,4-Epox	C4-OH	C5-OH	C6-OH	C7-OH	C8-OH	C9-OH	∑ Keto
*Cgl*UPO	2.8	0.0	56.2	11.9	1.3	0.0	0.0	0.0	0.0	27.9
*Mro*UPO	0.0	80.5	0.0	6.5	0.0	0.0	0.0	0.0	0.0	12.9
*Mwe*UPO	0.0	68.9	0.0	5.7	0.0	0.0	0.0	0.0	0.0	25.5
*Aae*UPO	3.0	71.0	0.0	4.2	0.0	0.0	5.2	1.9	0.0	14.7
*Cra*UPO2	1.6	55.6	0.0	5.2	0.0	0.0	8.1	2.7	0.0	26.7
*Ceu*UPOMQ5	2.6	76.0	0.0	3.7	0.0	0.0	5.7	0.0	0.0	11.9
*Cab*UPOMQ2	3.2	72.4	0.0	3.7	0.0	0.0	5.2	0.0	0.0	15.4
*Ceu*UPOMS3	0.0	60.6	0.0	6.3	0.0	0.0	7.7	2.3	0.0	23.2
*Cab*UPOMS2	0.0	68.6	0.0	5.4	0.0	0.0	5.9	2.0	0.0	18.0
r*Cab*UPO1	0.0	69.4	0.0	10.4	0.0	0.0	0.8	0.5	0.0	18.9
r*Cab*UPO2	0.0	79.5	0.0	4.1	0.0	0.0	5.0	0.0	0.0	11.4

Table S2. additional, numeric data for table 3, rel. product yield with 3-octenoic acid and various UPOs – product in %, apparently identified according to MS-ionization.

	C2-OH	C3-OH	3,4-Epox	C4-OH	C5-OH	C6-OH	C7-OH	C8-OH	∑ Keto
*Cgl*UPO	0.0	0.0	72.4	6.4	0.0	0.0	0.0	0.0	21.1
*Mro*UPO	0.0	89.0	0.0	5.4	0.0	0.0	0.0	0.0	5.6
*Aae*UPO	0.0	80.2	0.0	2.3	2.1	1.5	3.9	0.0	10.1

Table S3. additional, numeric data for table 4, rel. product yield with 3-heptenoic and various UPOs – product in %, apparently identified according to MS-ionization

	C2-OH	C3-OH	3,4-Epox	C4-OH	C5-OH	C6-OH	C7-OH	∑ Keto
*Cgl*UPO	0.0	0.0	92.1	7.9	0.0	0.0	0.0	0.0
*Mro*UPO	0.0	92.1	0.0	7.9	0.0	0.0	0.0	0.0
*Aae*UPO	0.0	41.8	0.0	5.5	52.7	0.0	0.0	0.0

Table S4. additional, numeric data for table 5, rel. product yield with *trans*-2-nonenoic and various UPOs – product in %, apparently identified according to MS-ionization. . * refers to a product that has been hydroxylated at an unknown position.

	C2-OH	2,3-Epox	C3-OH	C*	C4-OH	C5-OH	C6-OH	C7-OH	C8-OH	C9-OH	∑ Keto	di-OH
*Cgl*UPO	1.2	26.2	0.0	10.9	44.9	1.0	0.0	1.2	0.0	0.0	14.6	0.0

*Mro*UPO	30.3	8.0	16.6	0.0	4.3	0.0	0.0	0.0	0.0	0.0	0.0	40.9
*Mwe*UPO	39.6	5.5	31.1	0.0	4.8	0.0	0.0	4.2	0.0	0.0	0.0	14.8
*Aae*UPO	26.9	18.5	5.9	0.0	0.0	0.0	0.0	25.2	23.6	0.0	0.0	0.0
*Cra*UPO2	18.2	6.7	5.1	0.0	0.0	0.0	13.6	21.9	34.6	0.0	0.0	0.0
*Ceu*UPOMQ5	9.8	84.7	2.6	0.0	0.0	0.0	0.0	2.1	0.8	0.0	0.0	0.0
*Cab*UPOMQ2	12.4	80.3	2.8	0.0	0.0	0.0	0.0	3.3	1.3	0.0	0.0	0.0
*Ceu*UPOMS3	21.0	57.4	2.4	0.0	2.4	0.0	0.0	8.0	8.8	0.0	0.0	0.0
*Cab*UPOMS2	23.6	54.4	2.6	0.0	2.6	0.0	0.0	8.0	8.7	0.0	0.0	0.0
r*Cab*UPO1	33.9	4.9	18.5	0.0	2.1	0.0	0.0	4.1	36.6	0.0	0.0	0.0
r*Cab*UPO2	10.2	83.7	2.6	0.0	0.0	0.0	0.0	2.3	1.1	0.0	0.0	0.0

Table S5. additional, numeric data for table 6, rel. product yield with *trans*-2-octenoic acid and various UPOs – product in %, apparently identified according to MS-ionization. * refers to a product that has been hydroxylated at an unknown position.

	C2-OH	2,3-Epox	C3-OH	C*	C4-OH	C5-OH	C6-OH	C7-OH	C8-OH	∑ Keto
*Cgl*UPO	2.3	35.3	8.9	9.2	44.2	0.0	0.0	0.0	0.0	0.0
*Mro*UPO	12.3	4.3	0.0	0.0	11.9	0.0	0.0	0.0	0.0	71.6
*Aae*UPO	30.8	10.7	0.0	0.0	4.0	0.0	15.5	6.2	0.0	32.7

Table S6. additional, numeric data for table 7, rel. product yield with 2-heptenoic acid acid and various UPOs – product in %, apparently identified according to MS-ionization. * refers to a product that has been hydroxylated at an unknown position.

	C2-OH	2,3-Epox	C3-OH	C*	C4-OH	C5-OH	C6-OH	C7-OH	∑ Keto
*Cgl*UPO	0.0	60.2	0.0	10.6	29.2	0.0	0.0	0.0	0.0
*Mro*UPO	4.9	0.0	77.8	0.0	17.3	0.0	0.0	0.0	0.0
*Aae*UPO	52.3	11.1	0.0	0.0	4.9	9.2	11.0	0.0	11.6