Table S1 List of active and inactive compounds to open TmTRPA1 channels

| Active compounds to open TmTRPA1a | Inactive compounds to open TmTRPA1a | Active compounds to open TmTRPA1b/c | Inactive compounds to open TmTRPA1b/c |
|---|---|---|---|
| Eugenol | Cinnamaldehyde | Eugenol | Camphor |
| Carvacrol (0.5 mM) | 1,8-Cineole | Cinnamaldehyde | o-Methoxyphenol |
| 2-Undecanone | AITC | 1,8-Cineole | 2-Methoxy-4-methylphenol |
| Geranylacetone (0.5mM) | Creosote (0.1%) | AITC | Linoleic acid |
| Terpinen-4-ol | Methyl jasmonate | Carvacrol (0.5mM) | N,N-Diethyl-2-phenylacetamide |
| Nerol (1mM) | 2-Dodecanone | Creosote (0.1%) | Octanoic acid |
| | α-Terpineol | Methyl jasmonate | Decanoic acid |
| | Diallyl disulfide | 2-Undecanone | 1-Octanal |
| | 3,7-Dimethyl-6-octenal | Nerolidol | Borneol |
| | 2-Ethyl-1,3-hexanediol | Thujone | Coumarin |
| | Geraniol | 2-Dodecanone | Methyl salicylate |
| | Carveol | Geranylacetone (0.5 mM) | Verbenone |
| | Lauric acid | Myrtenal | |
| | 1-Octanol | Terpinen-4-ol | |
| | Nerolidol | β-Citronellol | |
| | Thujone | α-Terpineol | |
| | Myrtenal | Nerol (0.5 mM) | |
| | β-Citronellol | Diallyl disulfide | |
| | β-cyclocitral | 3,7-Dimethyl-6-octenal | |
| | Menthol (3 mM) | 2-Ethyl-1,3-hexanediol | |
| | Thymol | β-cyclocitral | |
| | Camphor | Menthol (3 mM) | |
| | o-Methoxyphenol | Geraniol | |
| | 2-Methoxy-4-methylphenol | Carveol | |
| | Linoleic acid | Thymol | |
| | N,N-Diethyl-2-phenylacetamide | Lauric acid | |
| | Octanoic acid | 1-Octanol | |
| | Decanoic acid | | |
| | 1-Octanal | | |
| | Borneol | | |
| | Coumarin | | |
| | Methyl salicylate | | |
| | Verbenone | | |

All compounds were tested at 1mM concentration except carvacrol, creosote, geranylacetone, nerol, and menthol. The concentrations used are indicated with parentheses.

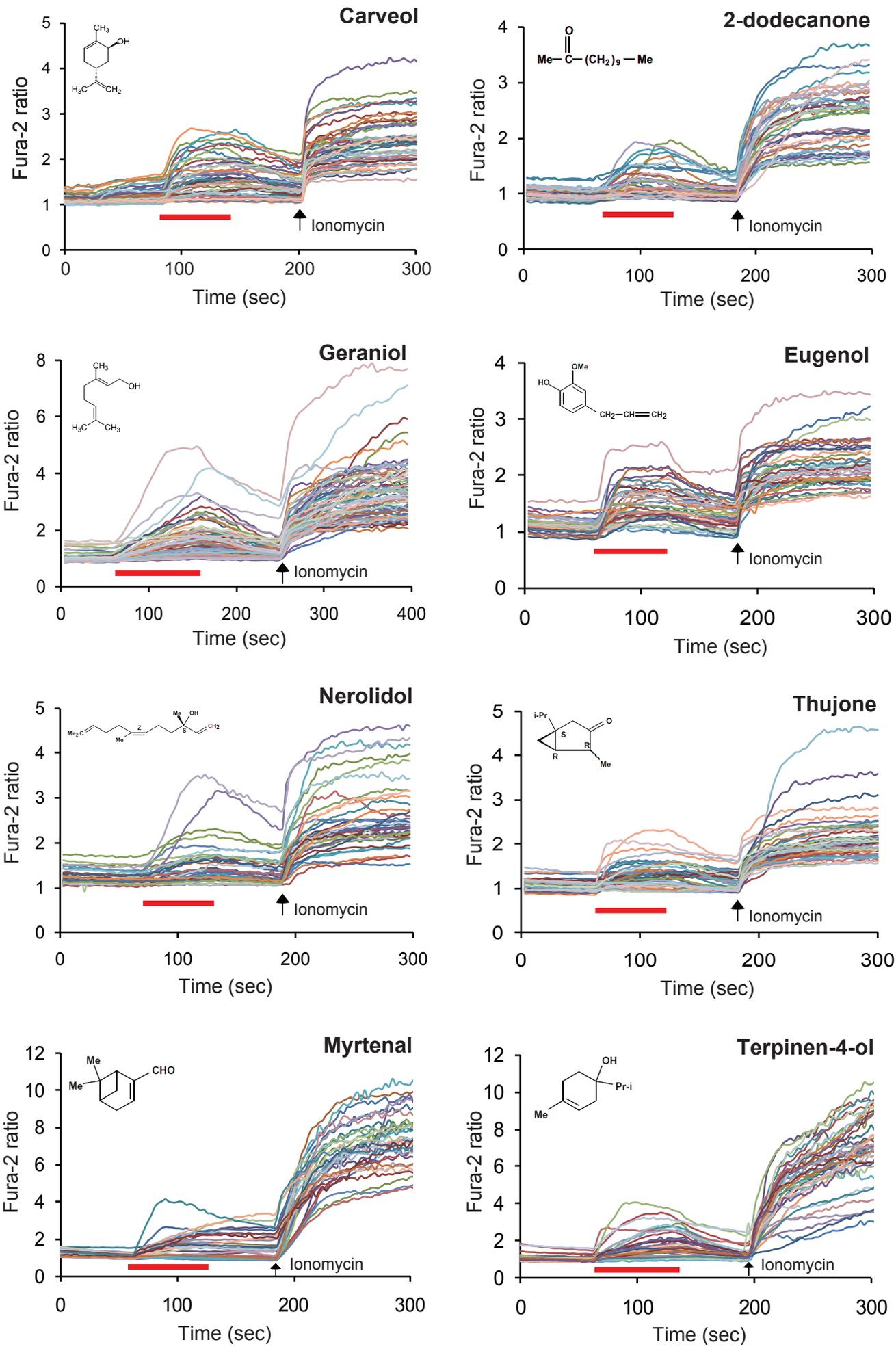
**Supplementary figure legends**

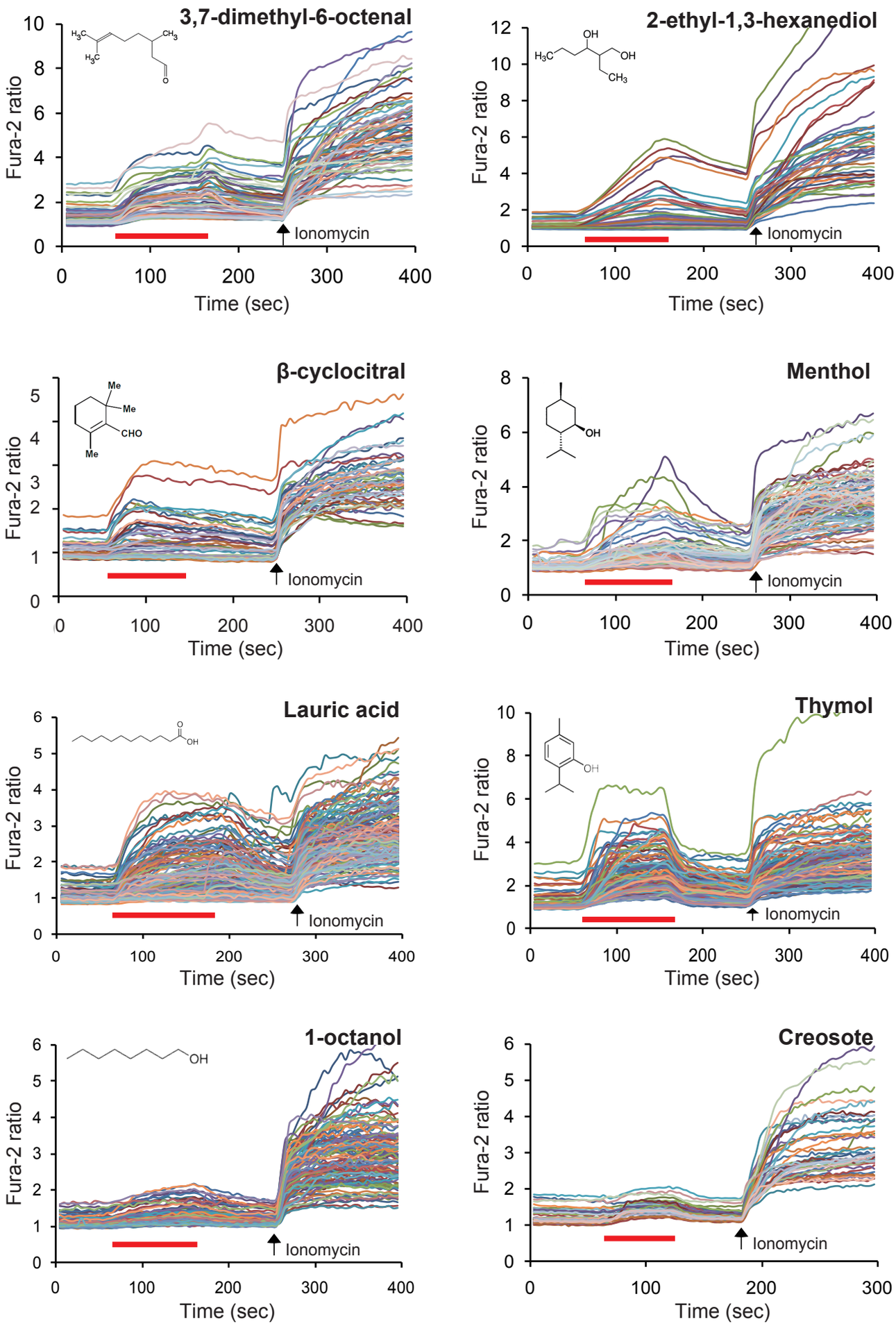
**Supplementary figures 1a and 1b**
Activation of TmTRPA1b by 16 plant-derived compounds analyzed by calcium imaging. Red bars show the period when each compound was added, and then washed off. Arrows indicate the time points when we added ionomycin. Chemical structure of each compound is also shown except creosote which is a mixture of different compounds. The concentration of each compound was 1 mM except for creosote (0.1%), and menthol (3mM).

**Supplementary figures 2a-2d**
Activation of TmTRPA1c by 27 plant-derived compounds analyzed by calcium imaging. Red bars show the period when each compound was added, and then washed off. Arrows indicate the time points when we added ionomycin. The concentration of each compound was 1 mM except for creosote (0.1%), geranylacetone (0.5mM), carvacrol (0.5 mM), nerol (0.5mM), and menthol (3mM).

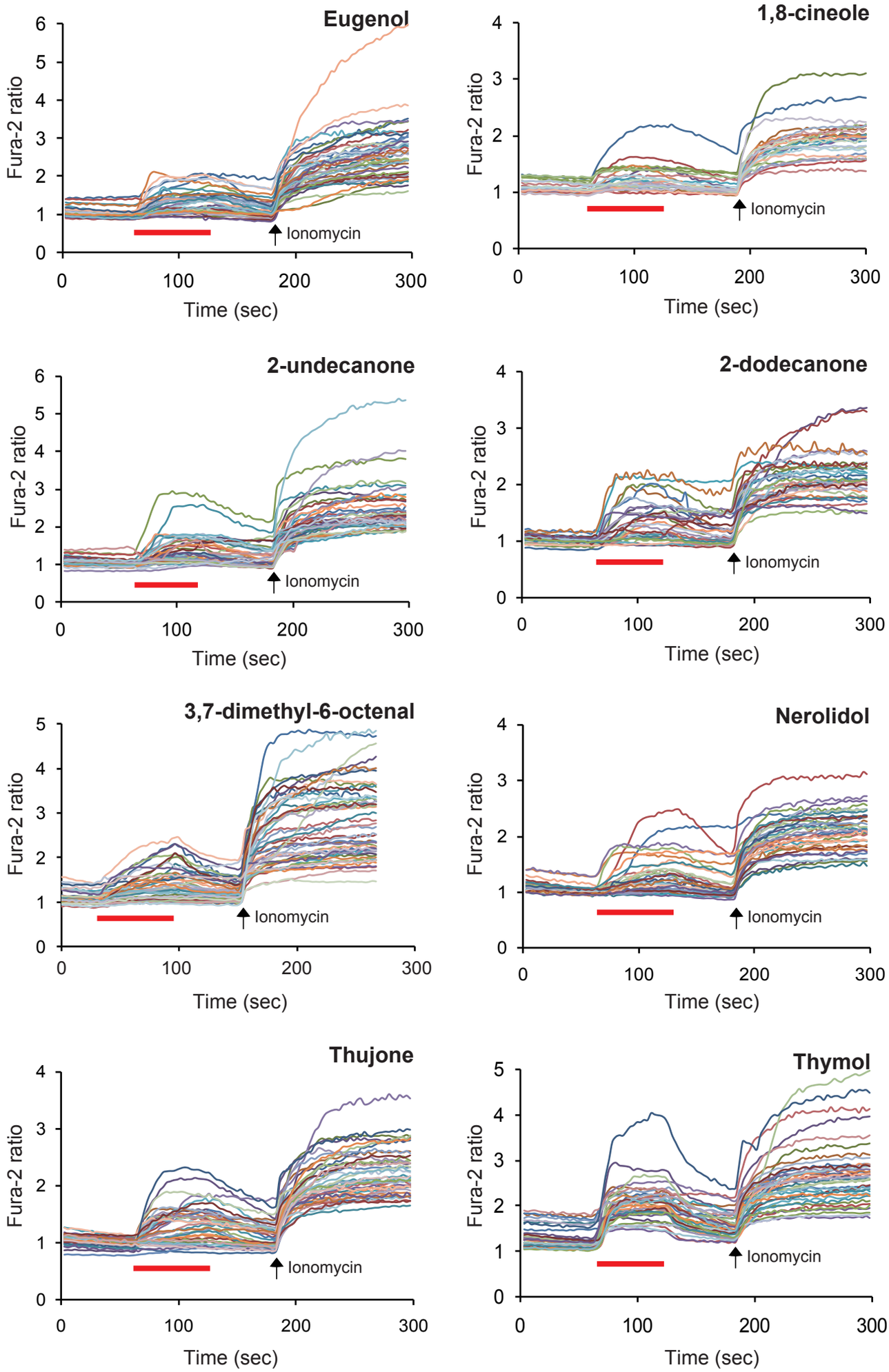
**Supplementary figure 3**
Activation of TmTRPA1a by eugenol and terpinen-4-ol analyzed by calcium imaging. Red bars show the period when each compound was added, and then washed off. Arrows indicate the time points when we added ionomycin. The concentration of each compound was 1 mM.

**Supplementary figure 4**
(A) Proteins expressed in HEK293 cells transfected with empty vector (Mock), TmTRPA1b wild type-, and the five deletion mutants (Δ84-92, Δ105-134, Δ77-134, Δ49-134, and Δ21-134)-expressing constructs were analyzed by western blot. The size (kD) of protein molecular weight marker (MW) is at the left. (B) Localizations of plasma membrane-bound FITC-WGA and either TmTRPA1b wild type, or the five deletion mutant (Δ84-92, Δ105-134, Δ77-134, Δ49-134, or Δ21-134) tagged with V5-epitope in the transfected HEK293 cells by immunofluorescence. The merged images are also shown.

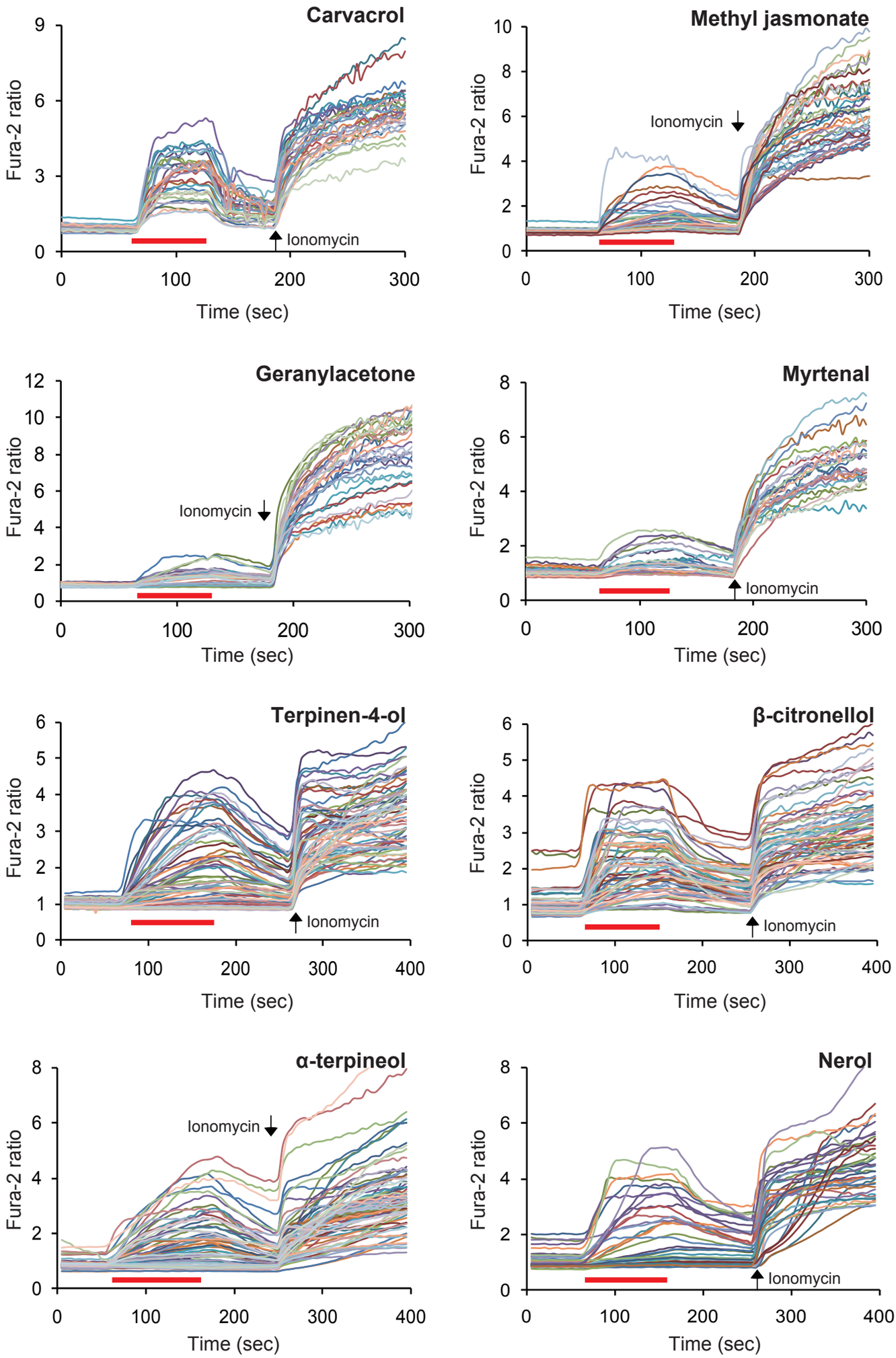

Carveol
Fura-2 ratio
Time (sec)
Ionomycin
2-dodecanone
Fura-2 ratio
Time (sec)
Ionomycin
Geraniol
Fura-2 ratio
Time (sec)
Ionomycin
Eugenol
Fura-2 ratio
Time (sec)
Ionomycin
Nerolidol
Fura-2 ratio
Time (sec)
Ionomycin
Thujone
Fura-2 ratio
Time (sec)
Ionomycin
Myrtenal
Fura-2 ratio
Time (sec)
Ionomycin
Terpinen-4-ol
Fura-2 ratio
Time (sec)
Ionomycin


3,7-dimethyl-6-octenal
2-ethyl-1,3-hexanediol
β-cyclocitral
Menthol
Lauric acid
Thymol
1-octanol
Creosote
Fura-2 ratio
Time (sec)
Ionomycin

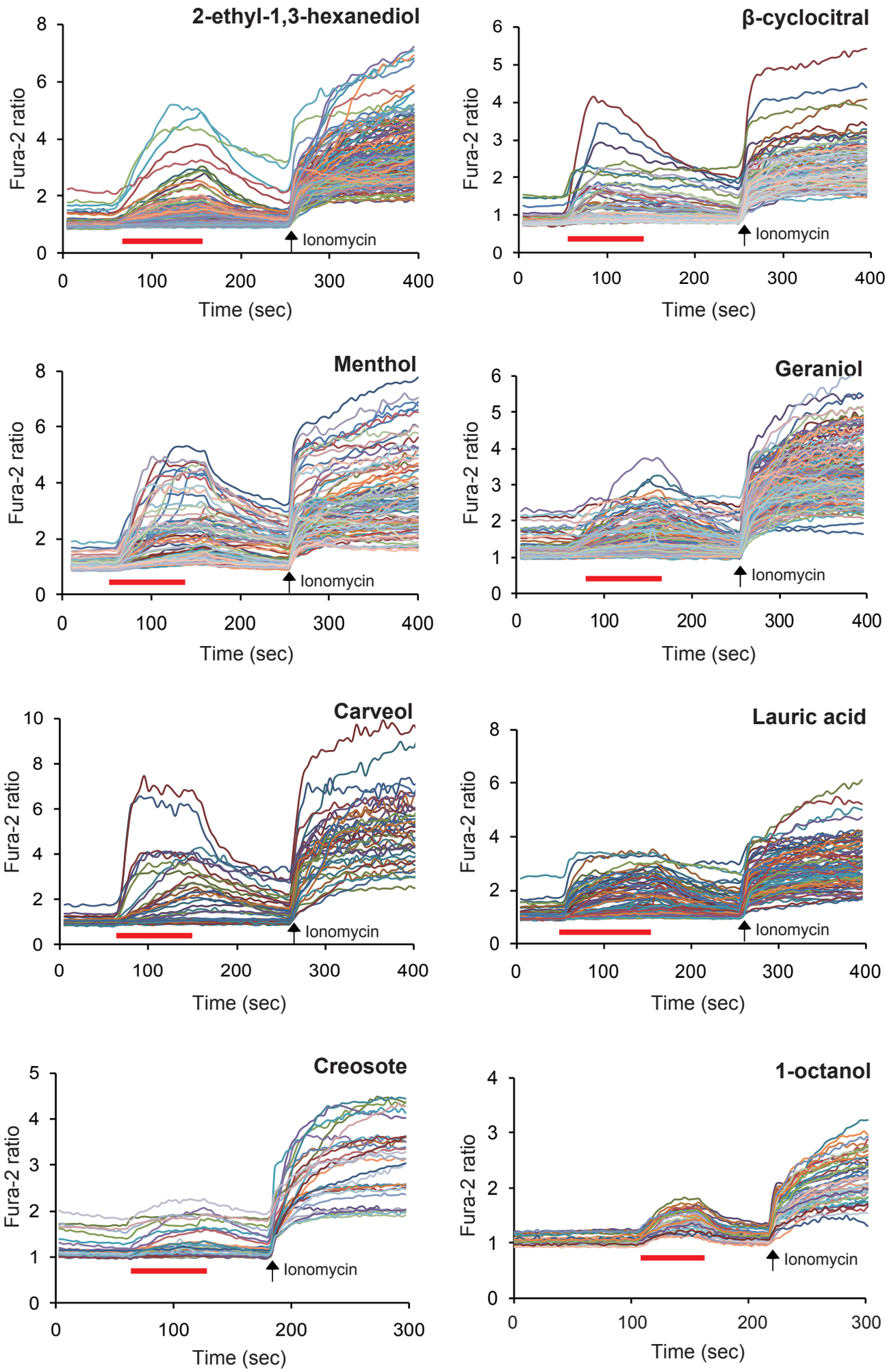
Supplementary figure 2a



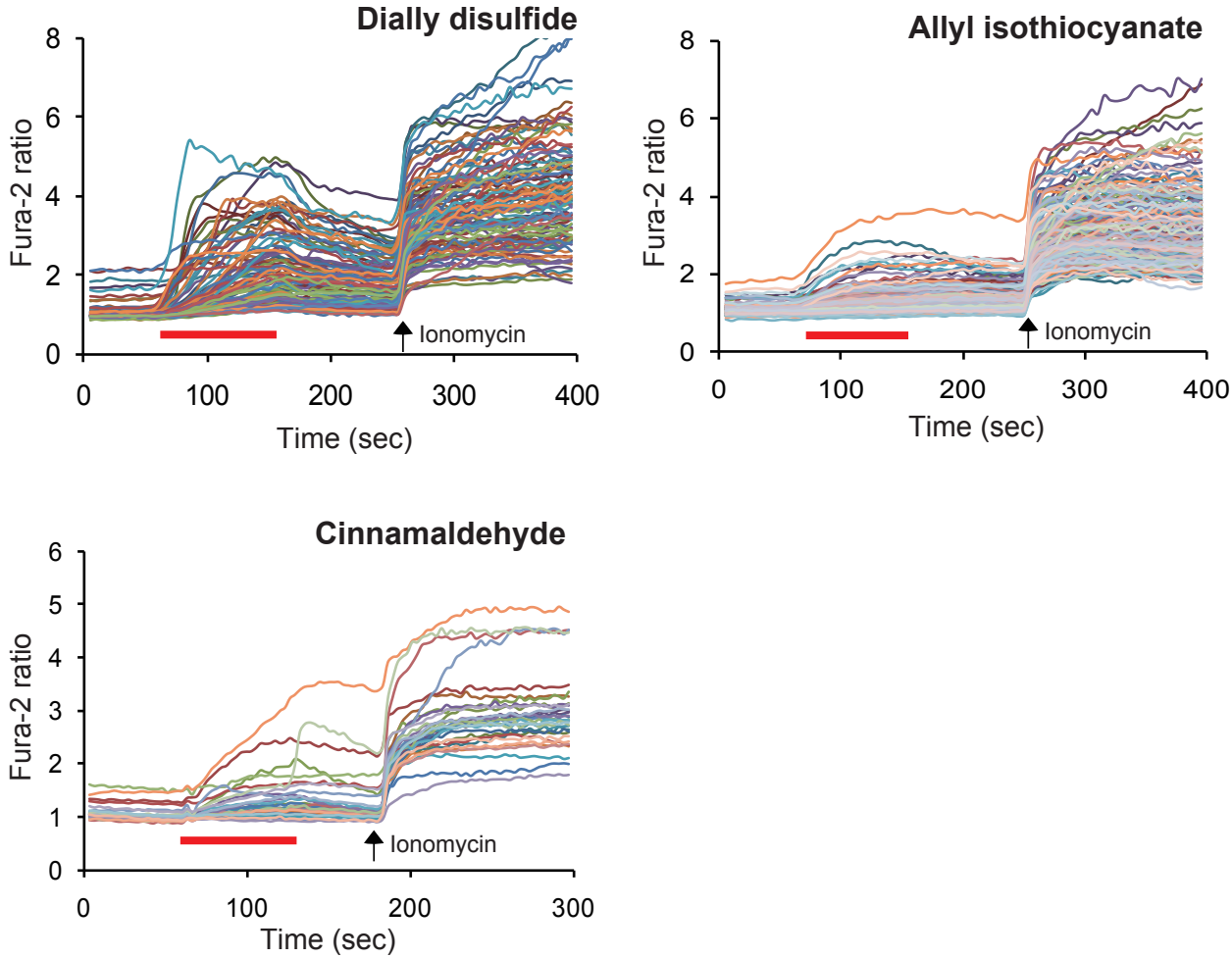
Supplementary figure 2b



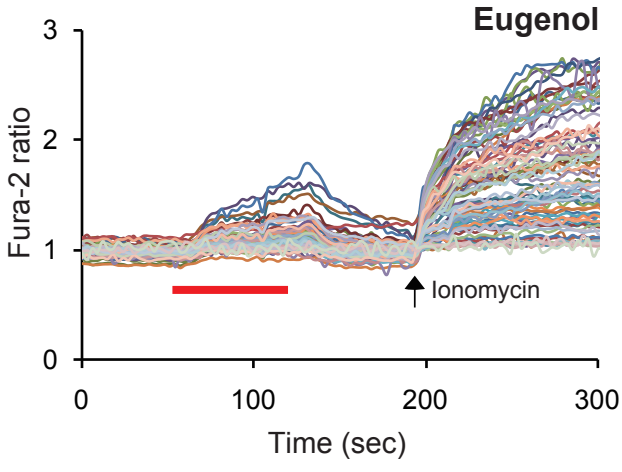
Supplementary figure 2c

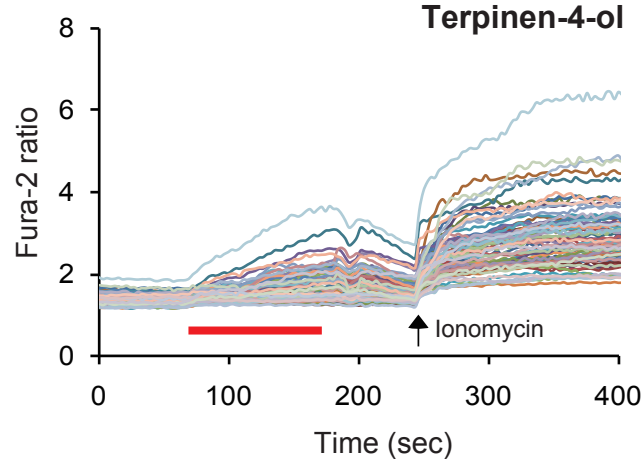


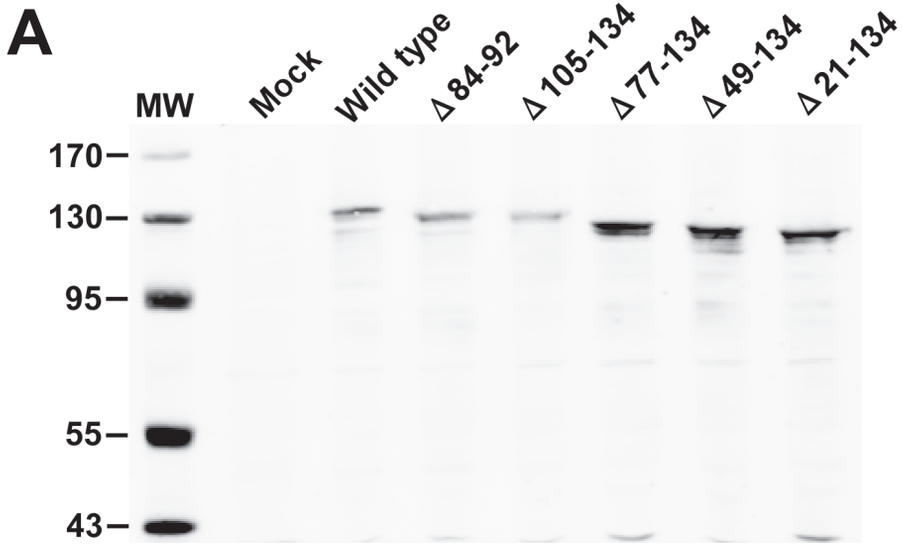
Supplementary figure 2d

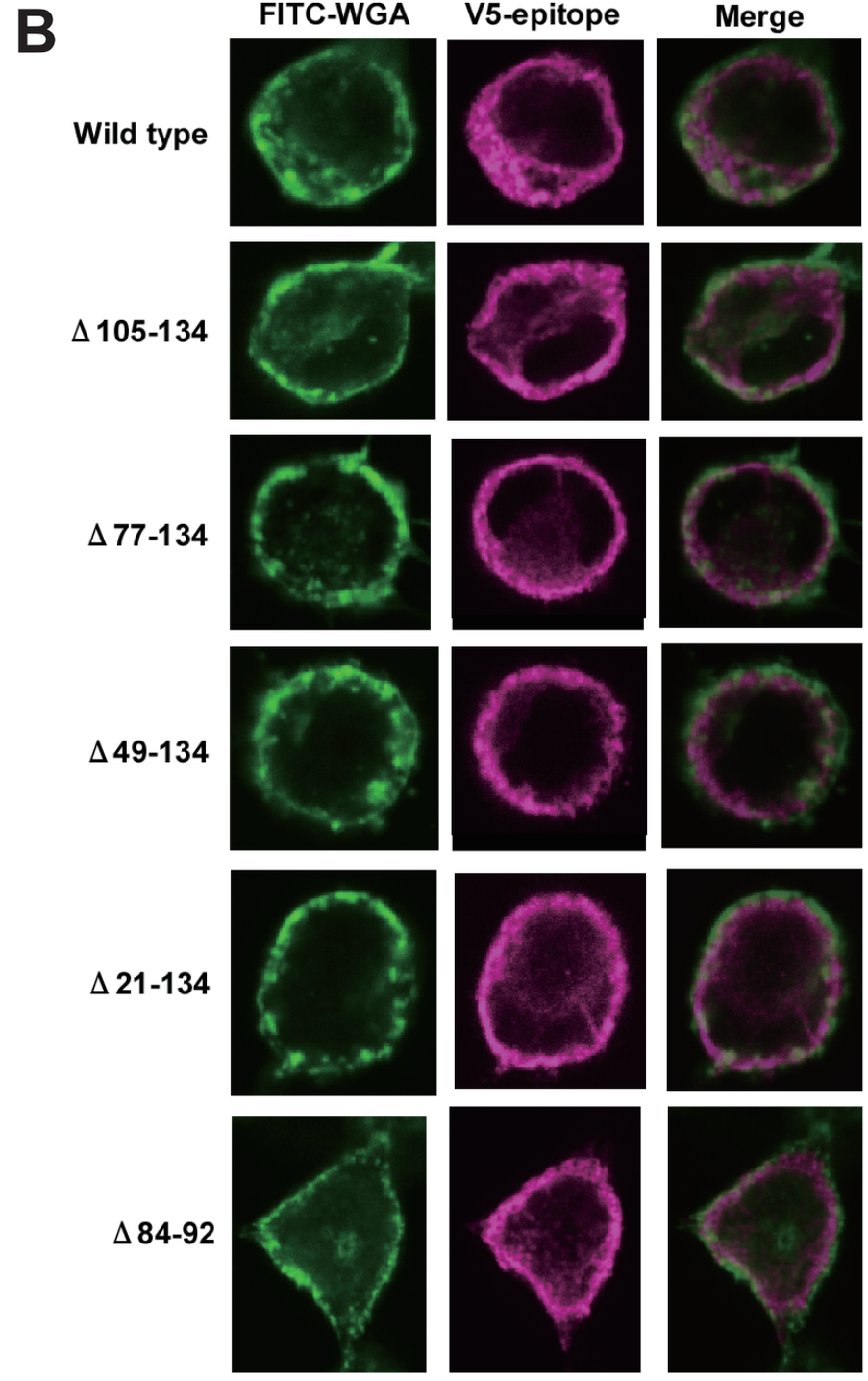


Supplementary figure 3




A
MW
Mock
Wild type
Δ84-92
Δ105-134
Δ77-134
Δ49-134
Δ21-134
170
130
95
55
43


B
FITC-WGA
V5-epitope
Merge
Wild type
Δ105-134
Δ77-134
Δ49-134
Δ21-134
Δ84-92