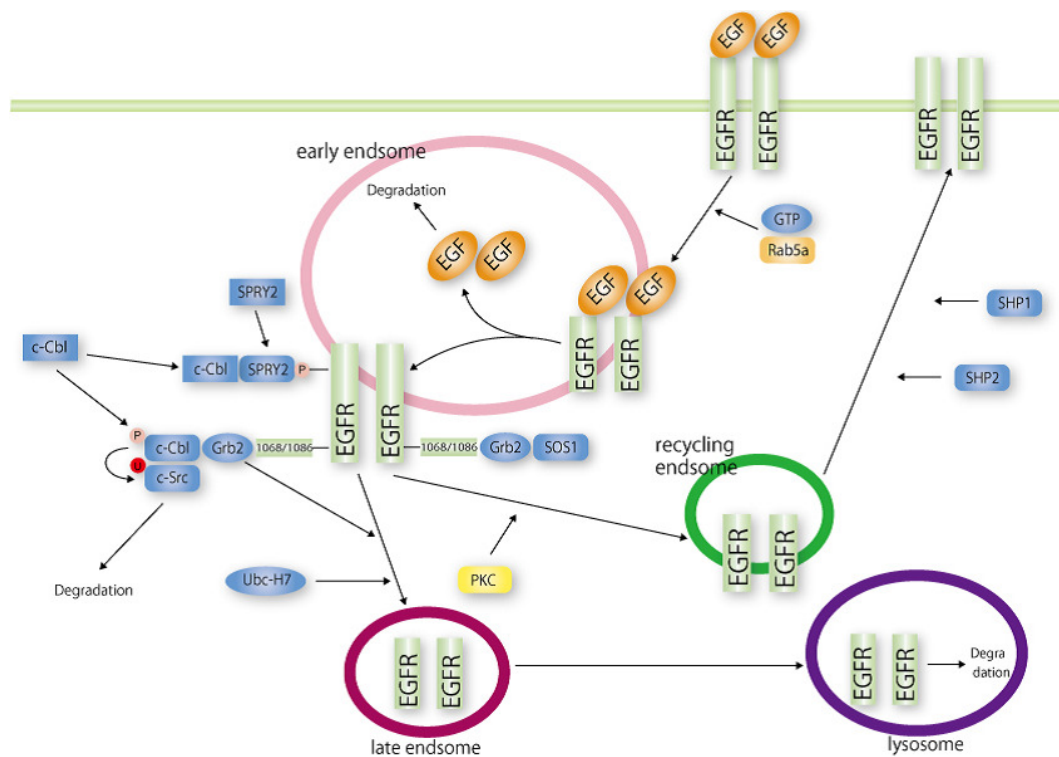# Supplementary Materials: Dependent Shrink of Transitions for Calculating Firing Frequencies in Signaling Pathway Petri Net Model
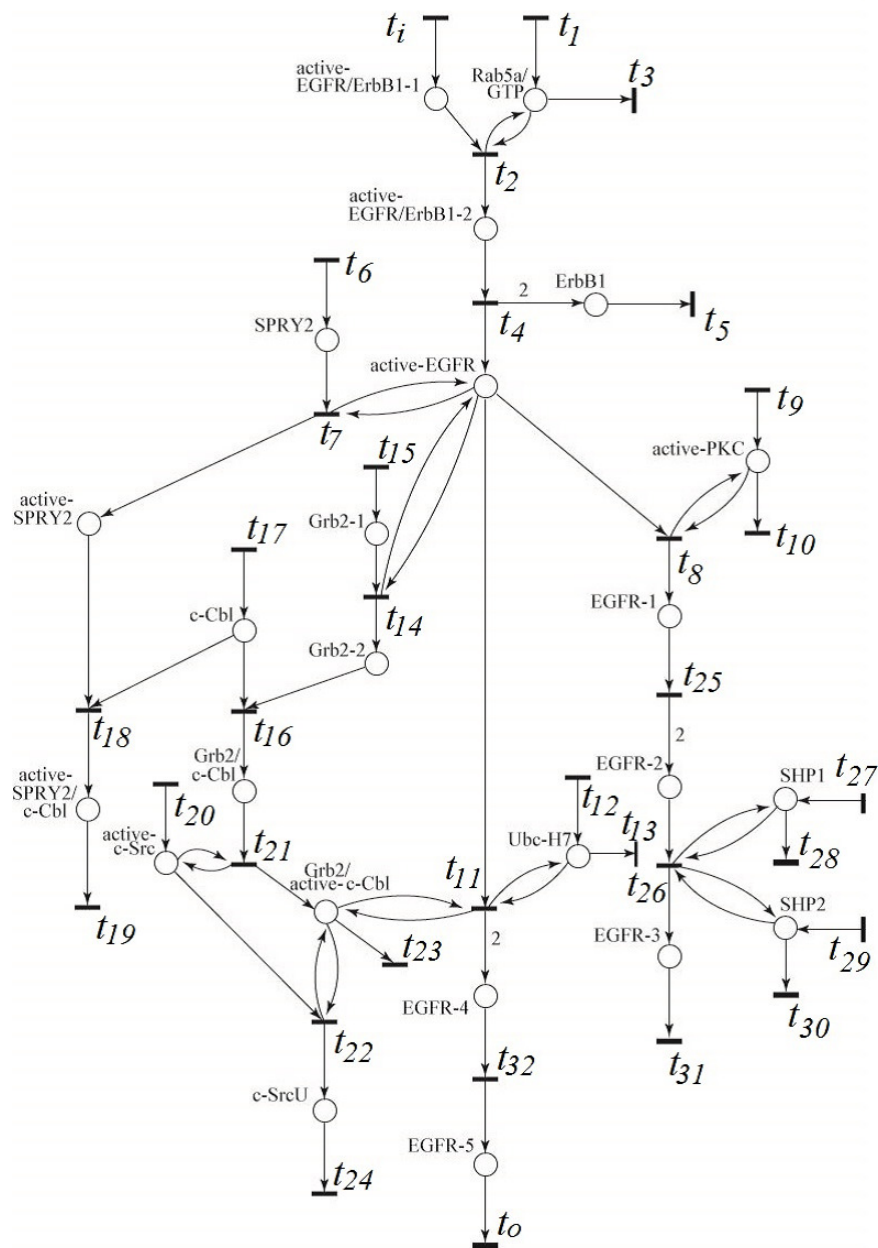
Atsushi Mizuta, Qi-Wei Ge and Hiroshi Matsuno
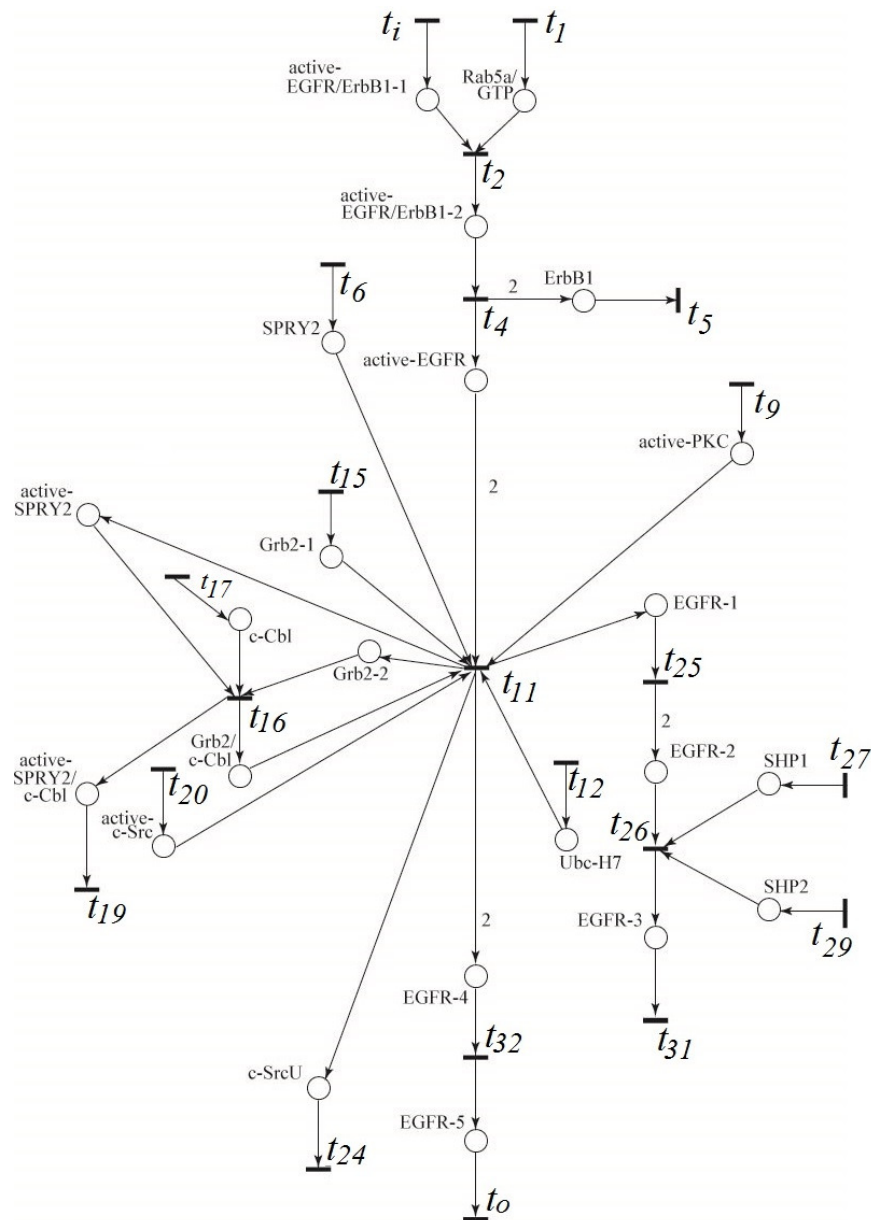
Inventory of Supplementary Information
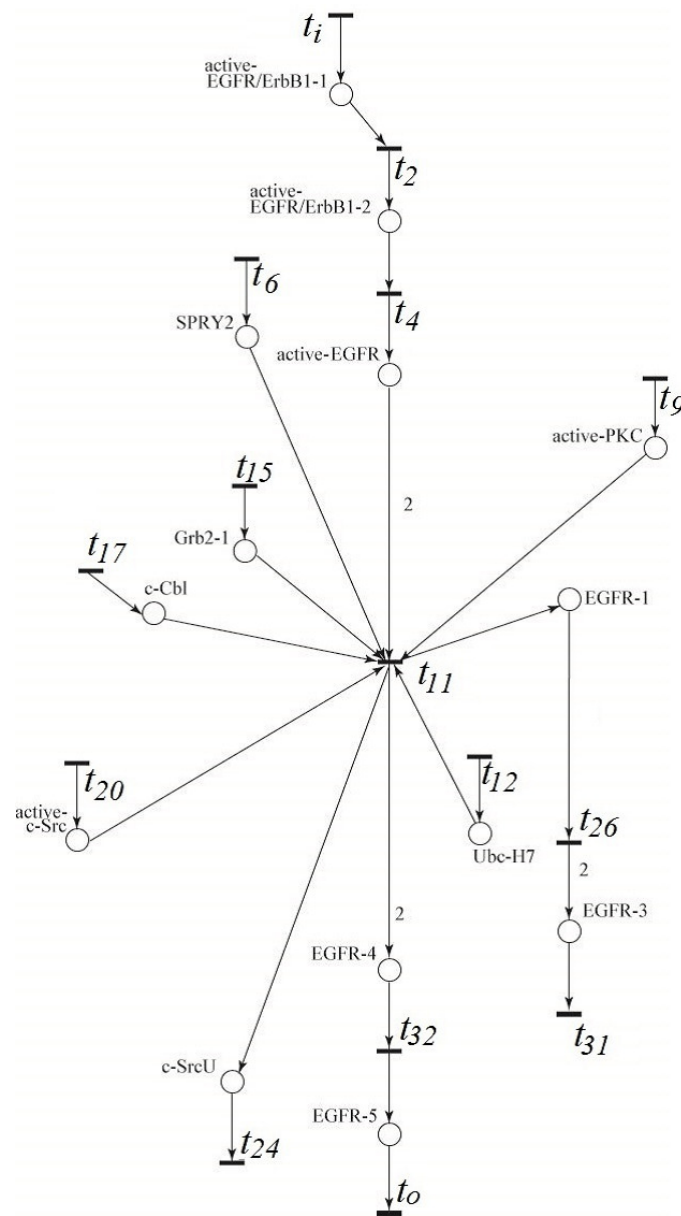
Supplementary Figures: Figures S1–S5.

Figure S1. Phenomenon model of the endocytosis signaling pathway, which is obtained from Petri net pathways (http://genome.ib.sci.yamaguchi-u.ac.jp/pnp/).
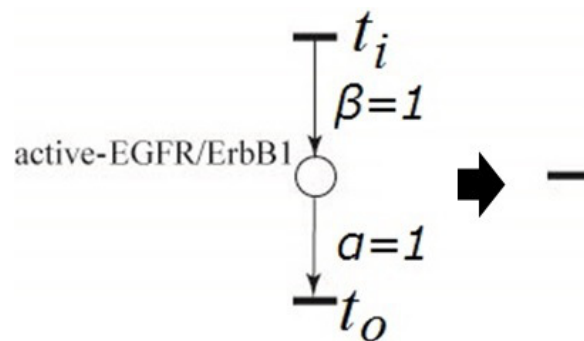
Figure S2. Original endocytosis Petri net model, to which Algorithm 1 is to be applied.

Figure S3. An intermediate net is obtained by shrinking all of the self-loops related to transitions, t_2, t_7, t_8, t_{11}, t_{14}, t_{21}, t_{22} and t_{26}, and all of the conflict structures related to transition sets, $\{t_2, t_3\}$, $\{t_7, t_8, t_{11}, t_{14}\}$, $\{t_8, t_{10}\}$, $\{t_{11}, t_{13}\}$, $\{t_{16}, t_{18}\}$, $\{t_{11}, t_{22}, t_{23}\}$, $\{t_{21}, t_{22}\}$, $\{t_{26}, t_{28}\}$ and $\{t_{26}, t_{30}\}$. As a result, t_3, t_7, t_8, t_{10}, t_{13}, t_{14}, t_{18}, t_{21}, t_{22}, t_{23}, t_{28} and t_{30} are shrunk.

Figure S4. An intermediate net is obtained by processing single-input single-output structure related to places, Rab5a/GTP, ErbB1, active-SPRY2, Grb2-2, Grb2/c-Cbl, active-SPRY2/c-Cbl, EGFR-2, SHP1 and SHP2, and as a result, t_1, t_5, t_{16}, t_{19}, t_{25}, t_{27} and t_{29} are shrunk.

Figure S5. The resultant nets of the final and one step before.