

Comprehensive Chromatographic Analysis of Futibatinib Impurities by HPLC and LC-MS/MS: Structural Elucidation, Degradation Kinetics, and *In-Silico* Toxicity Assessment

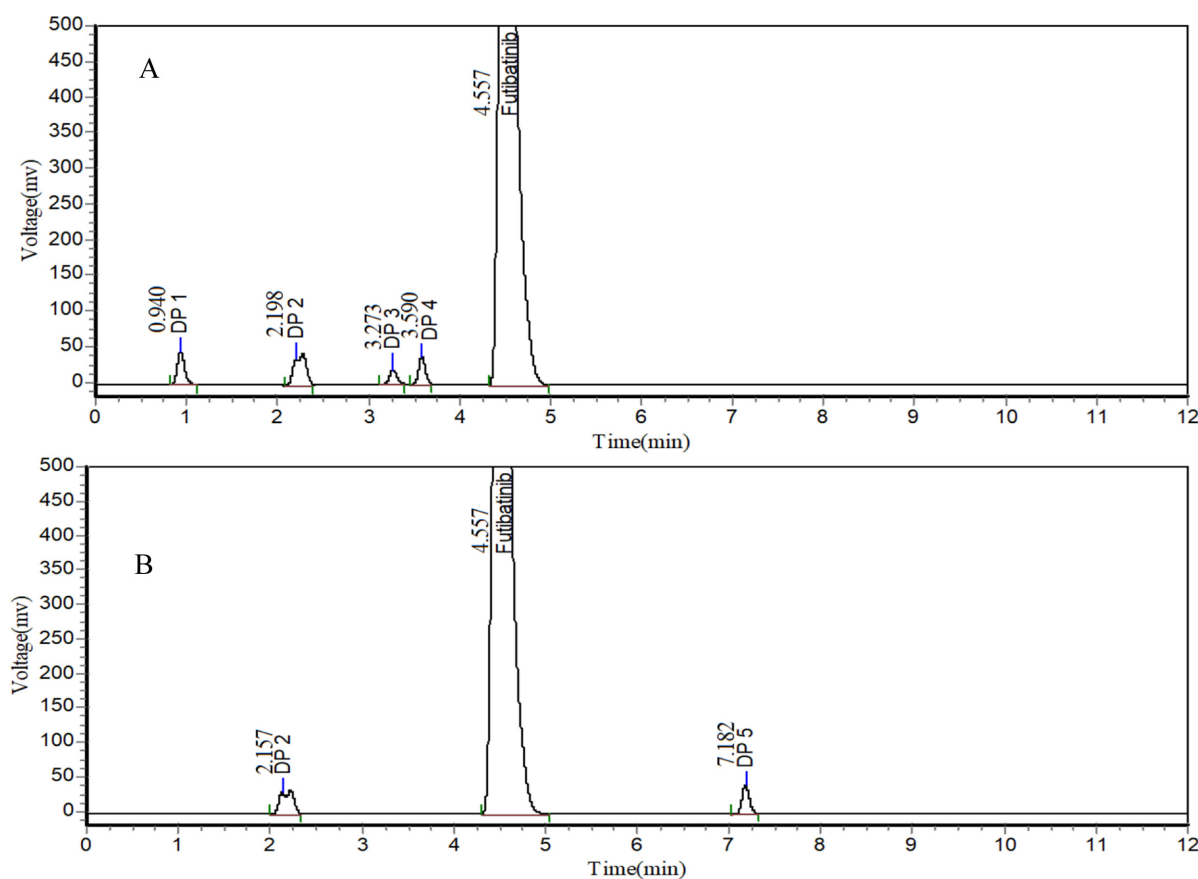
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(A) acid-induced degradation chromatogram and (B) peroxide-induced degradation chromatogram
Figure S1. Chromatographic profiles of futibatinib obtained under stress conditions using the optimized method

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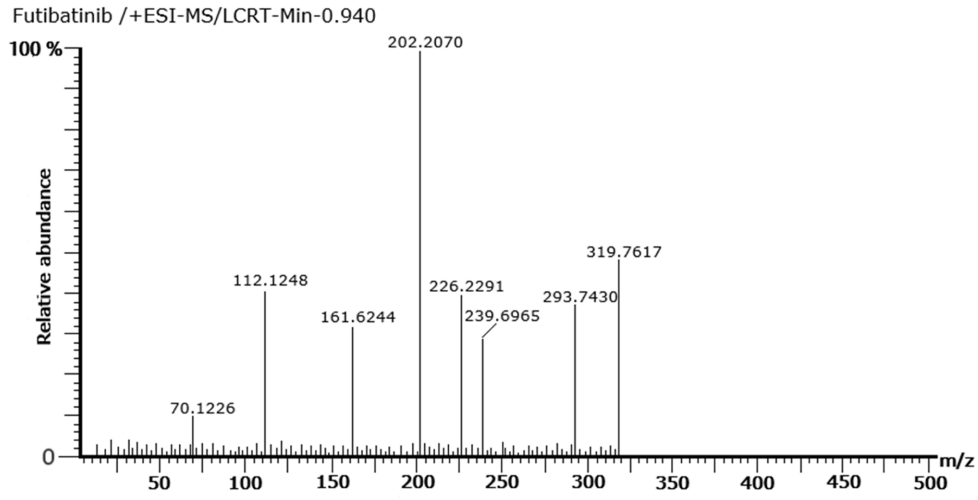


Figure S2. Mass spectra observed for DP 1 in the study of Futibatnib

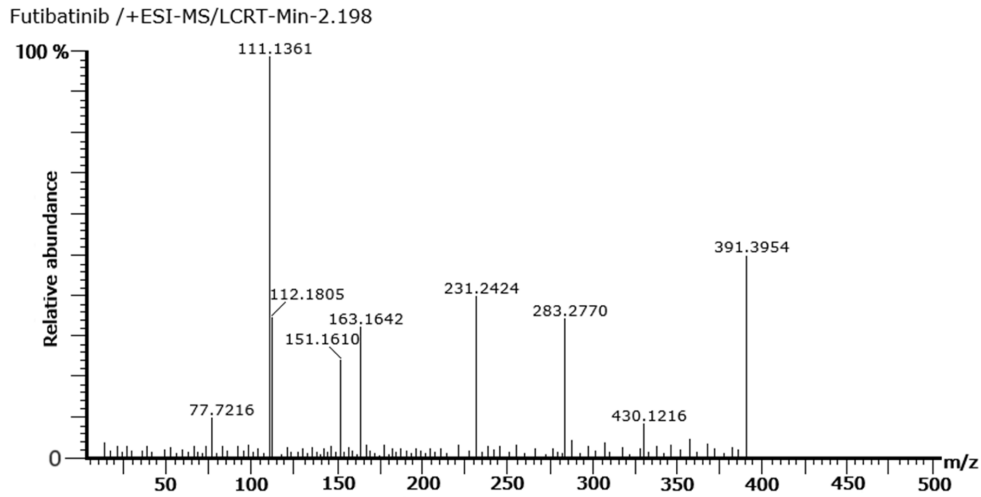


Figure S3. Mass spectra observed for DP 2 in the study of Futibatnib

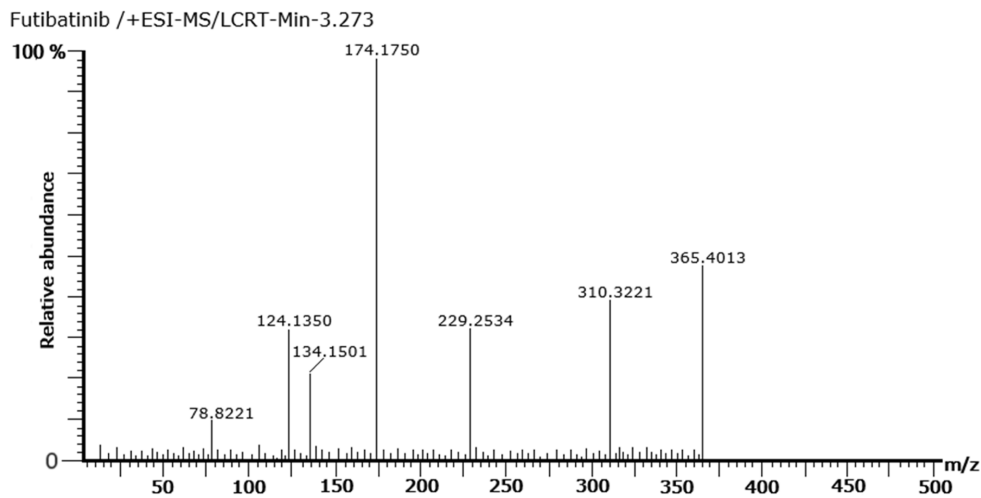


Figure S4. Mass spectra observed for DP 3 in the study of Futibatnib

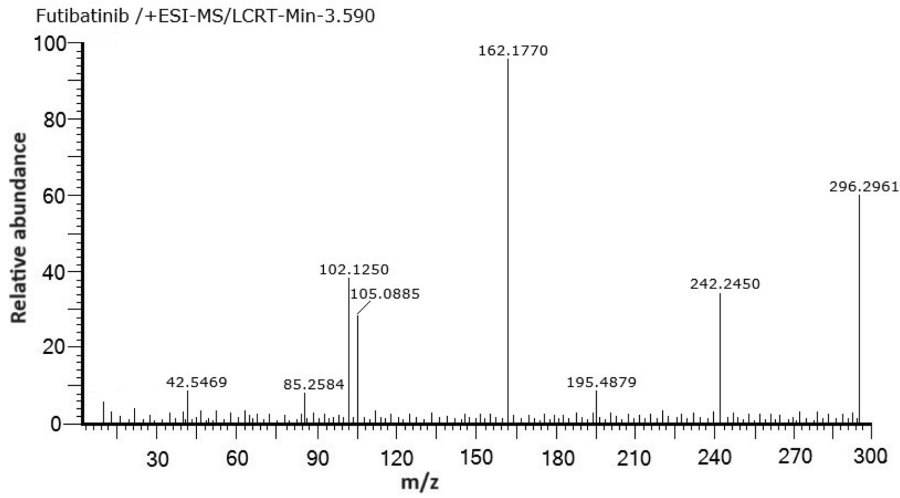


Figure S5. Mass spectra observed for DP 4 in the study of Futibatinib

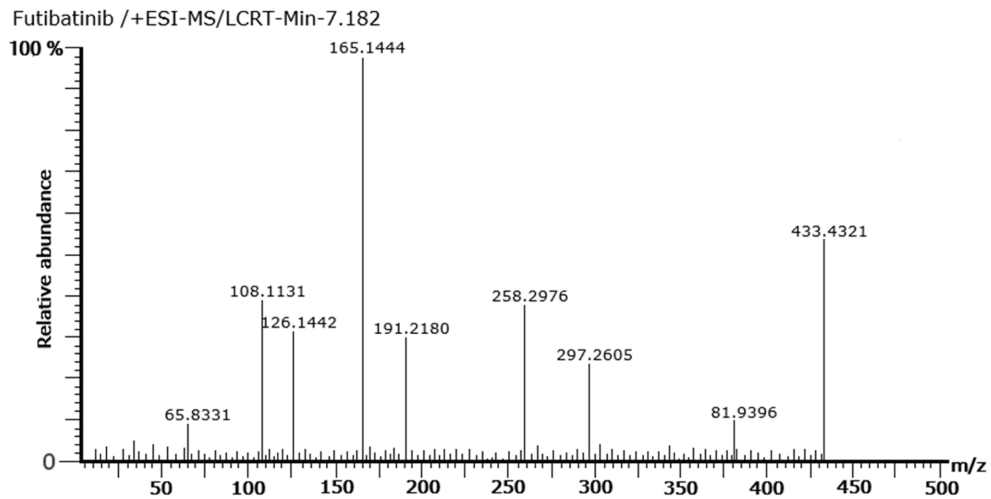


Figure S6. Mass spectra observed for DP 5 in the study of Futibatinib

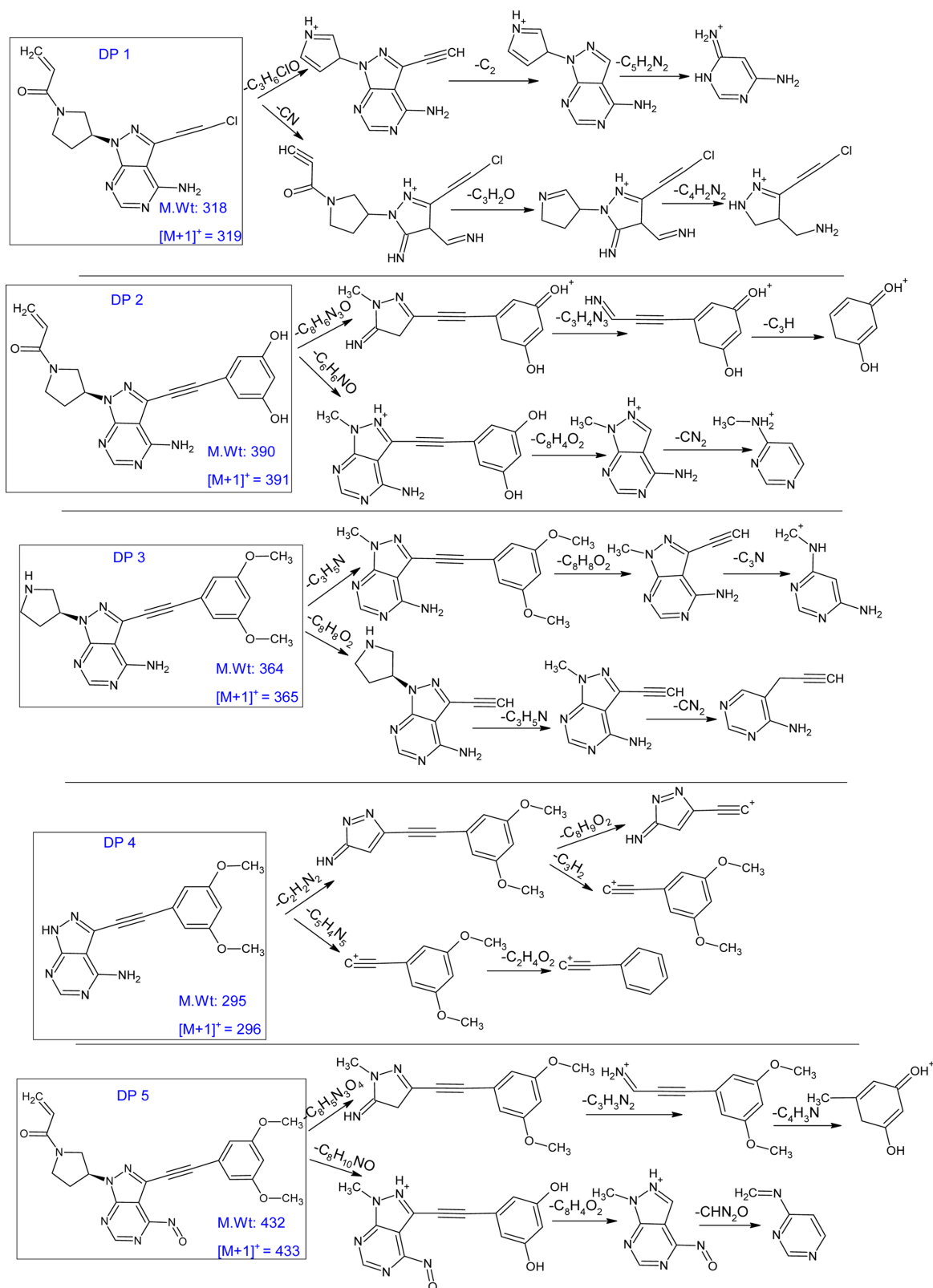


Figure S7. Proposed fragmentation pathways illustrate the MS/MS fragmentation patterns of DPs of futibatinib formed under stress conditions that support their structural identification.

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Table S1. Stress degradation study results of futibatinib in the optimized method

S No	Condition	Stress time	% assay	% degradation	DPs identified
1	Acid (2 M HCl)	12 h	63.42	36.58	4 (DP 1 to 4)
2	Base (0.1 M NaOH)	12 h	94.57	5.43	-
3	Oxidative (30% H ₂ O ₂)	2 h	70.43	29.57	2 (DP 2 and 5)
4	Dry heat (100°C)	2h	97.64	2.36	-
5	Photolytic (Sunlight)	4 h	95.09	4.91	-
6	Neutral (water)	30 min	98.67	1.33	-

Average results of three experiment (n=3)