Supporting Information for:

Abiotic Formation of Uroporphyrinogen and Coproporphyrinogen from Acyclic Reactants

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Fig. S1. ESI-MS data.

(A) Uroporphyrinogen obtained from reaction of 1-AcOH and ALA (120 mM, pH 5, 60 °C, 24 h), calcd 837.2825 for $(M+H)^+$ where $M = C_{40}H_{44}N_4O_{16}$.

(B) Uroporphyrin obtained upon oxidation of a sample from the reaction of 1-AcOH and ALA (120 mM, pH 5, 60 °C, 24 h), calcd 831.2356 for $(M+H)^+$ where $M = C_{40}H_{38}N_4O_{16}$.



Fig. S2. ESI-MS data for coproporphyrinogen obtained from the reaction of **1-Me** and **ALA** (120 mM, pH 7, 60 °C, 24 h), calcd 661.3232 for $(M+H)^+$ where $M = C_{36}H_{44}N_4O_8$.





(A) ESI-MS data, calcd 655.2762 for $(M+H)^+$ where $M = C_{36}H_{38}N_4O_8$.

(B) LC-ESI-MS data. HPLC was performed at 50 °C on a C18 column (50 x 2.1 mm, 2.7 μ m particles) with the following solvents [A = 98% water and 2% CH₃CN; B = 98% CH₃CN, 2% water, and 0.3% formic acid]. The gradient elution regimen consisted of 25% B for 2 min, transition to 50% B over 8 min, then transition to 25% B over 3 min. The CH₃CN itself contained 2% water. Detection of the ion current in the mass channel *m*/*z* 653.88 – 656.89 [(M + H)⁺] shows three putative coproporphyrin isomers.



Table S1. Observation of Fischer-Fink pyrroles under diverse reaction conditions.^a

CO₂H

OMe

0

℃O₂H

Entry	Conditions	Compound	obsd m/z	calcd
1	30 mM, pH 5,	MeO-FF-U	336.1058	$336.1054 (M + Na)^+$
	60 °C, 24 h			
2	120 mM, pH 5,	MeO-FF-U	314.1234	$314.1234 (M + H)^+$
	60 °C, 24 h		336.1056	$336.1054 (M + Na)^+$
3	120 mM, pH 5,	MeO-FF-U	314.1223	$314.1234 (M + H)^+$
	25 °C, 96 h		336.1041	$336.1054 (M + Na)^+$
4	120 mM, pH 7,	MeO-FF-U	336.1052	$336.1054 (M + Na)^+$
	25 °C, 96 h			
5	120 mM, pH 5,	MeO-FF-U	314.1244	$314.1234 (M + H)^+$
	60 °C, 72 h		336.1053	$336.1054 (M + Na)^+$
6	120 mM, pH 7,	MeO-FF-U	336.1058	$336.1054 (M + Na)^+$
	60 °C, 72 h			
7	60 mM, pH 5,	MeO-FF-C	292.1161	$292.1155 (M + Na)^+$
	60 °C, 24 h			
8	120 mM, pH 7,	MeO-FF-C	292.1154	$292.1155 (M + Na)^+$
	60 °C, 24 h			
9	120 mM, pH 7,	MeO-FF-C	292.1163	$292.1155 (M + Na)^+$
	25 °C 96 h			

^aThe data are provided for each sample wherein the mass spectrum was examined for the presence of the Fischer-Fink product, illustrating the breadth of conditions under which such products are formed.

Table S2. Pyrroles derived upon condensation of ALA and a 3-substituted 2,4-diketone (4-R).



^{*a*}Reaction at 60 °C with 60 mM reactants (equimolar **ALA** and **5-R**) for 24 h at pH 5 (0.5 M sodium acetate buffer). ^{*b*}Reaction at 60 °C with 60 mM reactants (equimolar ALA and **5-R**) for 24 h with no buffer (the HCl from **ALA** was neutralized with one equivalent of NaOH).