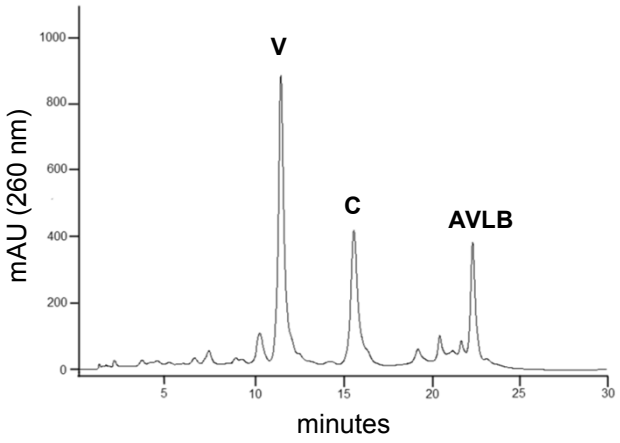

Figure S1. HPLC chromatogram of an alkaloid extract from *C. roseus* leaves showing the major presence of vindoline (V), catharanthine (C) and α-3',4'-anhydrovinblastine (AVLB).

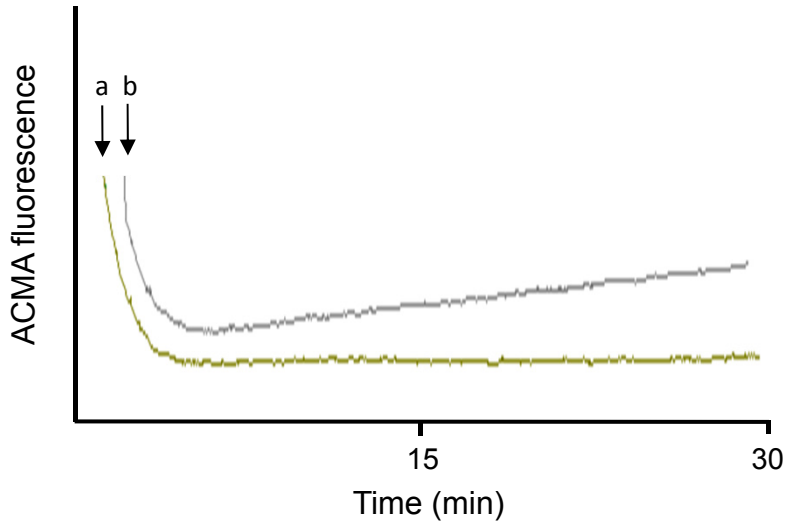

Figure S2. H^+ pumping activity in tonoplast vesicles upon addition of 1 mM of ATP in the presence (a) or in the absence (b) of an ATP regenerating system (10 mM of creatine phosphate plus 10 µg mL^{-1} of creatine kinase). In the absence of this regenerating system, after 1 min the system can not maintain the H^+ gradient. The H^+ pumping activity was measured by the fluorescence quenching of the pH-sensitive probe ACMA.

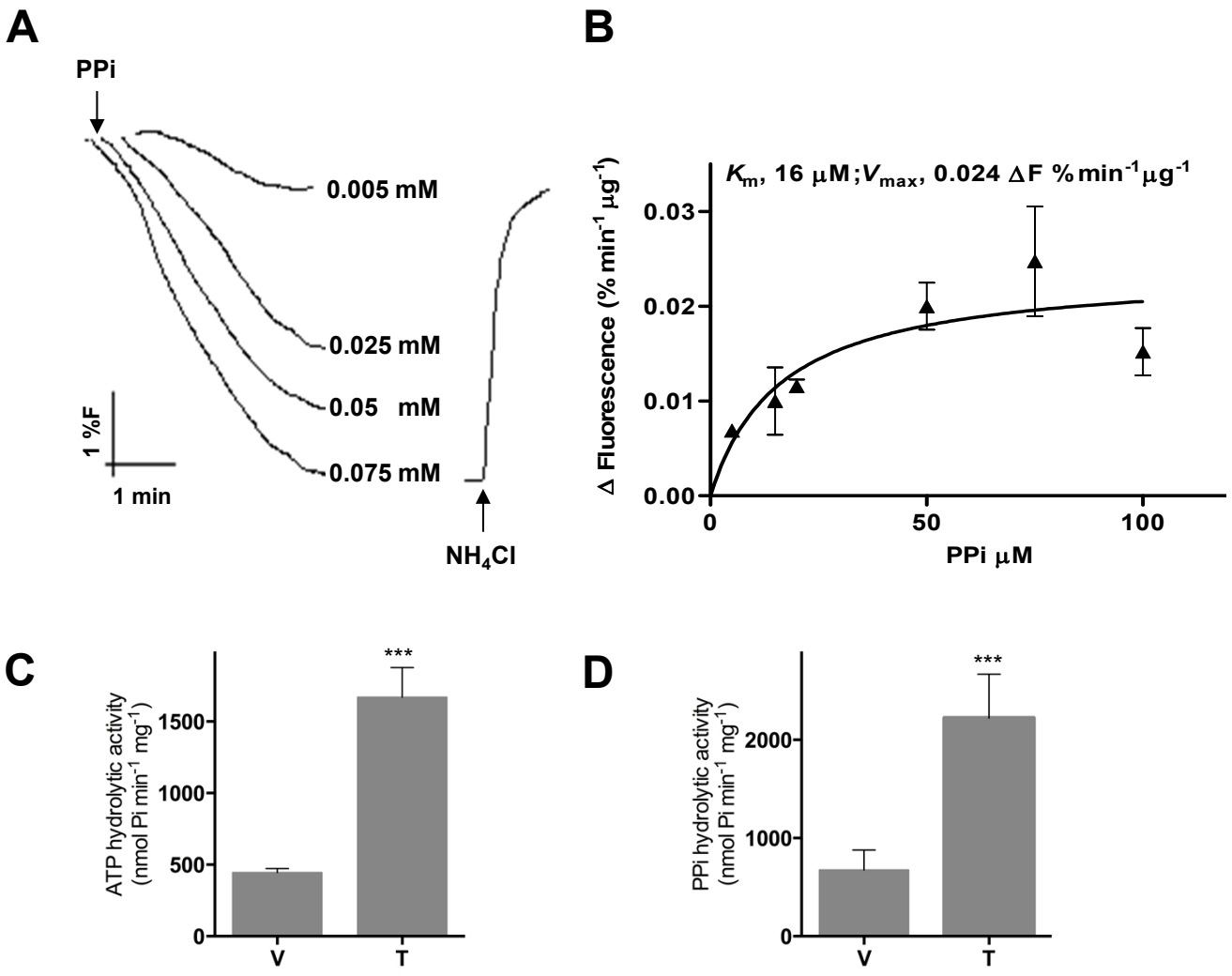

Figure S3. Pumping activities of V-H^+-PPase in tonoplast vesicles and ATP and PPi hydrolytic activities in vacuoles and tonoplast vesicles isolated from *C. roseus* leaves. A, H^+ pumping activity in tonoplast vesicles upon addition of PPi, measured by the fluorescence quenching of the pH-sensitive probe ACMA. B, Michaelis-Menten plot of the initial rates of proton pumping in A. Error bars indicate SD (n = 3). C, ATP hydrolytic activity of intact vacuoles (V) and tonoplast vesicles (T), in the presence of the P-H^+-ATPase inhibitor vanadate (100 μM) and the F-H^+-ATPase inhibitor azide (5 mM), to detect only the V-H^+-ATPase activity. D, PPi hydrolytic activity of intact vacuoles (V) and tonoplast vesicles (T). Statistical significance was evaluated using Student's *t* test for pairwise comparison (*** $P < 0.001$). Data significantly different are indicated. Error bars indicate SD (n = 3).

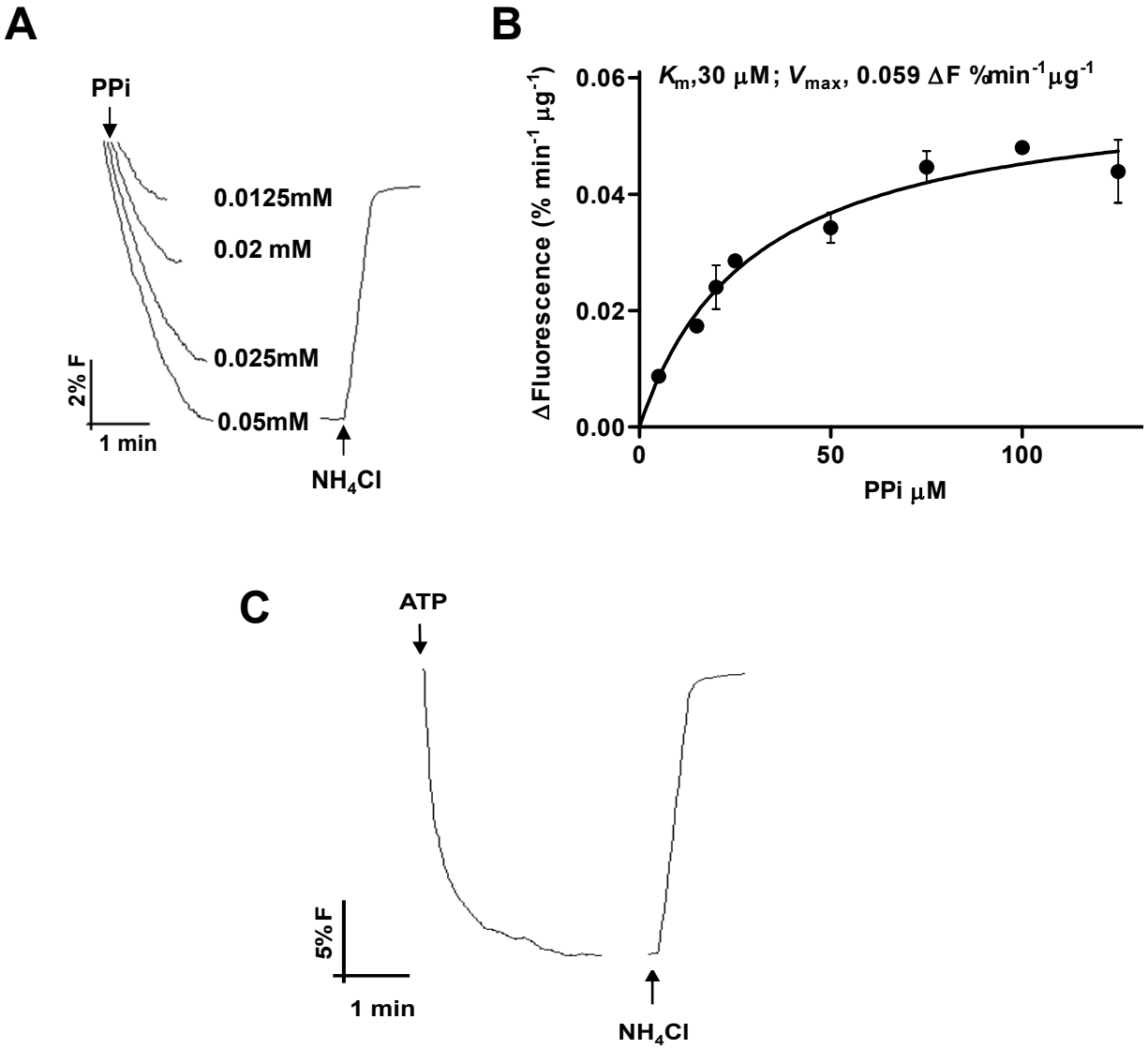

Figure S4. Pumping activity of V-H^+-PPase and V-H^+-ATPase in intact vacuoles from *C.roseus* leaves. A, H^+ pumping activity in intact vacuoles upon addition of PPi, measured by the fluorescence quenching of the pH-sensitive probe ACMA. B Michaelis-Menten plot of the initial rates of proton pumping in A. C, H^+ pumping activity in intact vacuoles upon addition of ATP, measured by the fluorescence quenching of the pH-sensitive probe ACMA. Error bars indicate SD (n = 3).