July 2026
DEA-SFL1-DOSE-26-004

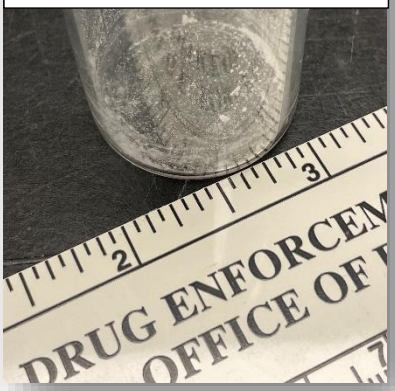
New Substance Public Alert
4-Fluoro-3-methyl diethylcathinone

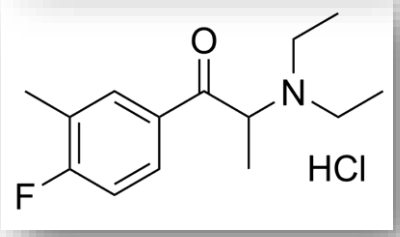
BACKGROUND

An unknown material was submitted to the DEA Special Testing and Research Laboratory through the Unknown Identification Support program. The white chalky rock-like material consisted of nicotinamide, sec-butyl butylone, and an unidentified novel cathinone. The Palm Beach County Sheriff's Office submitted the sample to the Special Testing and Research Laboratory for unknown assistance in April 2026.

DEA has identified the material as 4-fluoro-3-methyl diethylcathinone. This substance has not been previously reported by DEA or by the National Forensic Laboratory Information System (NFLIS). To confirm the positional isomer, reference material was synthesized from known starting materials and compared directly against the seized sample. Examiners are reminded to exercise caution and select appropriate testing methods to ensure the accurate identification of specific positional isomers.

Figure 1 Photograph of white powdery unknown material submitted to the DEA laboratory.





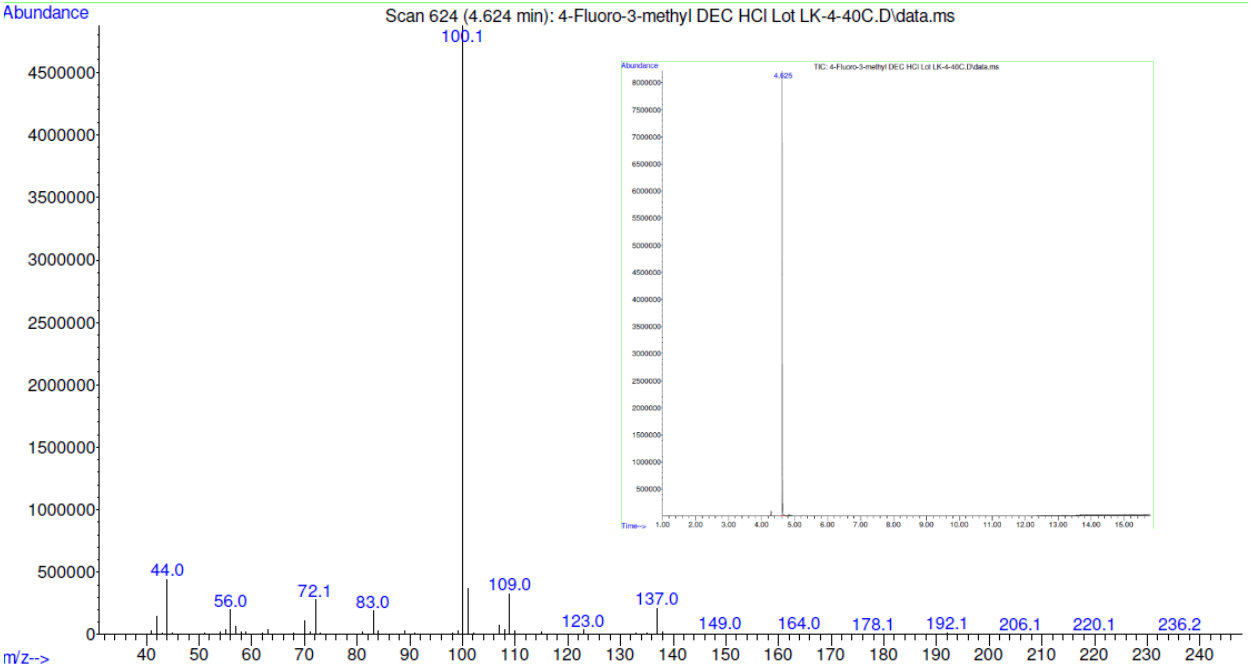
CHEMICAL INFORMATION

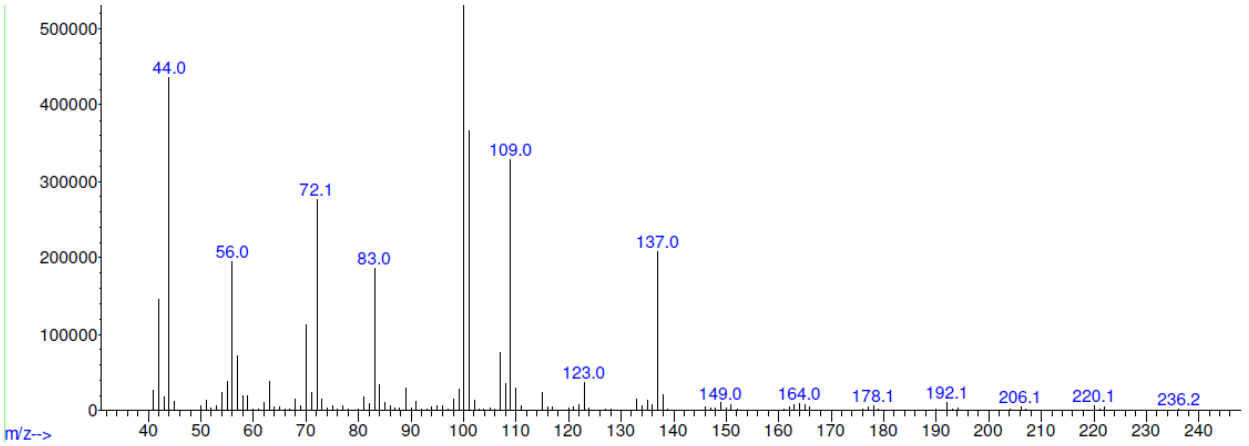
Chemical Name: 2-(diethylamino)-1-(4-fluoro-3-methylphenyl) propan-1-one
Molecular Formula: $C_{14}H_{20}FNO$
Molecular Weight: 237.3184 g/mol
Exact Mass: 237.1529 g/mol
CAS RN: None
Reference Material: Not commercially available

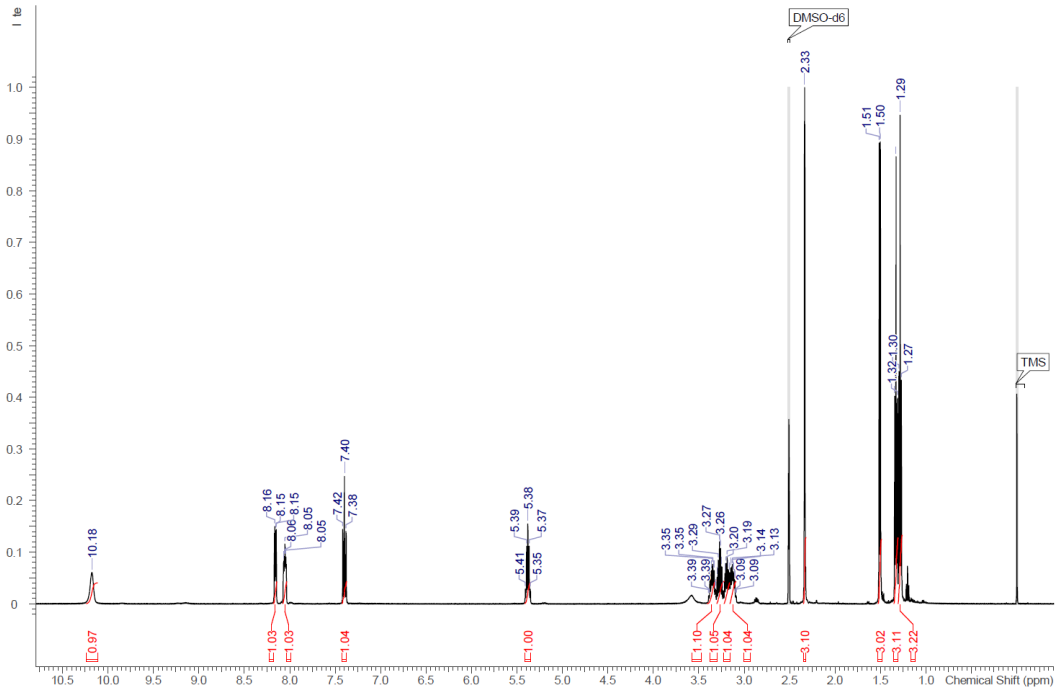
ANALYTICAL DATA

Analytical data was collected from synthesized material.

GC-EI-MS data (with zoomed MS) for 4-Fluoro-3-methyl diethylcathinone (4.625 min GUARDS retention time, base peak = 100 m/z)

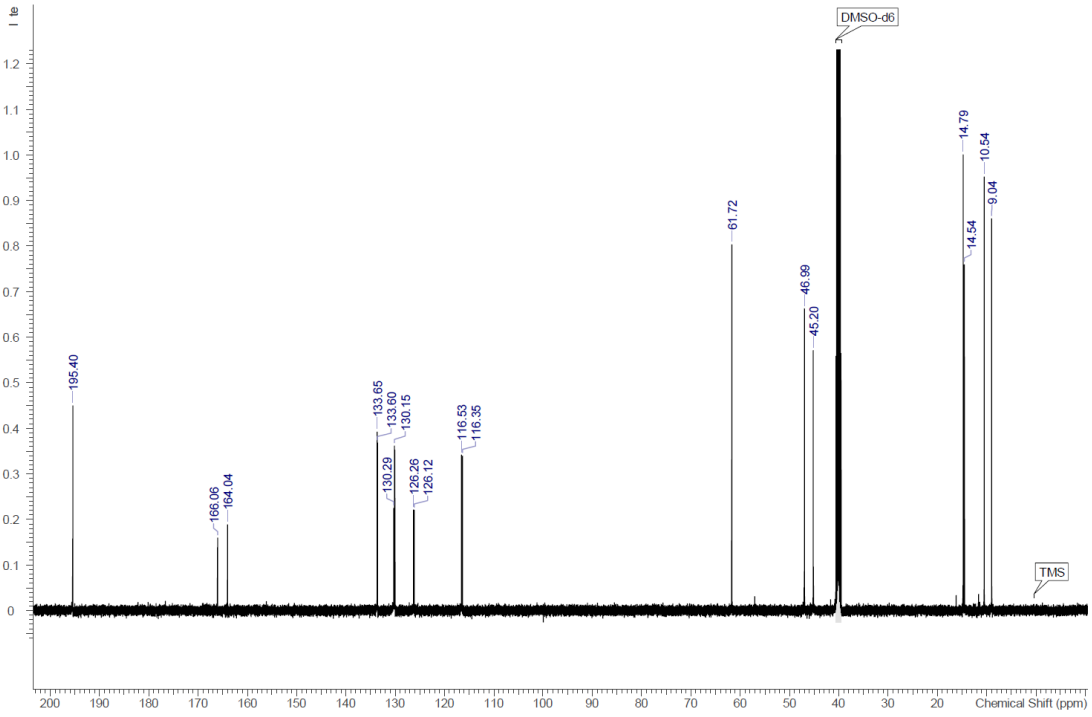






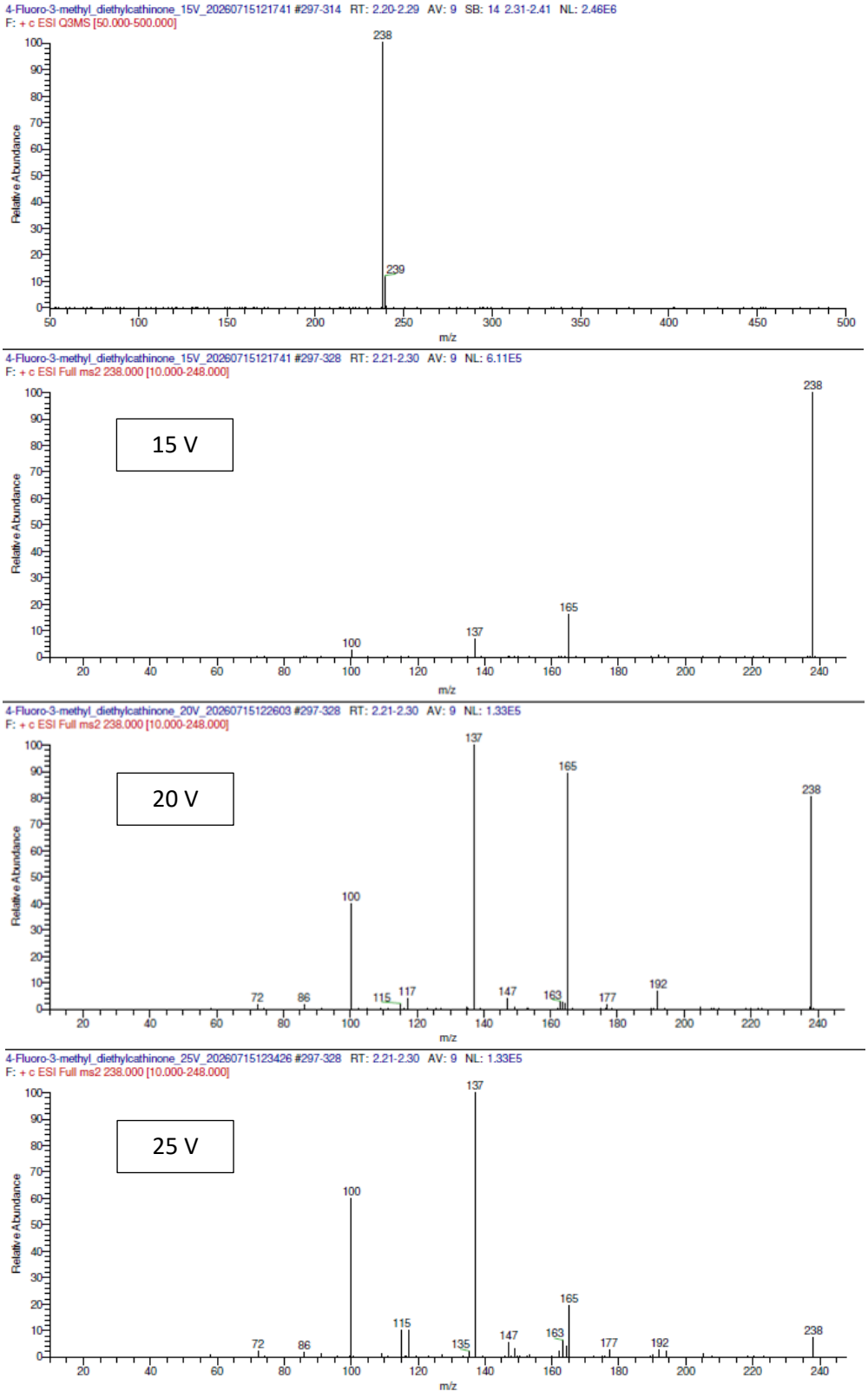
^{1}H NMR (500 MHz, DMSO-d_6) δ = 10.18 (br s, 1H), 8.16 (dd, J = 1.7, 7.3 Hz, 1H), 8.08 - 8.03 (m, 1H), 7.40 (t, J = 9.0 Hz, 1H), 5.38 (dq, J = 5.9, 7.2 Hz, 1H), 3.35 (dqd, J = 2.4, 7.3, 14.1 Hz, 1H), 3.27 (qd, J = 7.3, 14.1 Hz, 1H), 3.19 (dqd, J = 2.0, 7.3, 14.1 Hz, 1H), 3.13 (dqd, J = 3.0, 7.3, 14.1 Hz, 1H), 2.34 (d, J = 1.1 Hz, 3H), 1.51 (d, J = 7.1 Hz, 3H), 1.33 (t, J = 7.3 Hz, 3H), 1.29 (t, J = 7.3 Hz, 3H)

^{1}H NMR spectrum of 4-Fluoro-3-methyl diethylcathinone hydrochloride (DMSO-d_6)

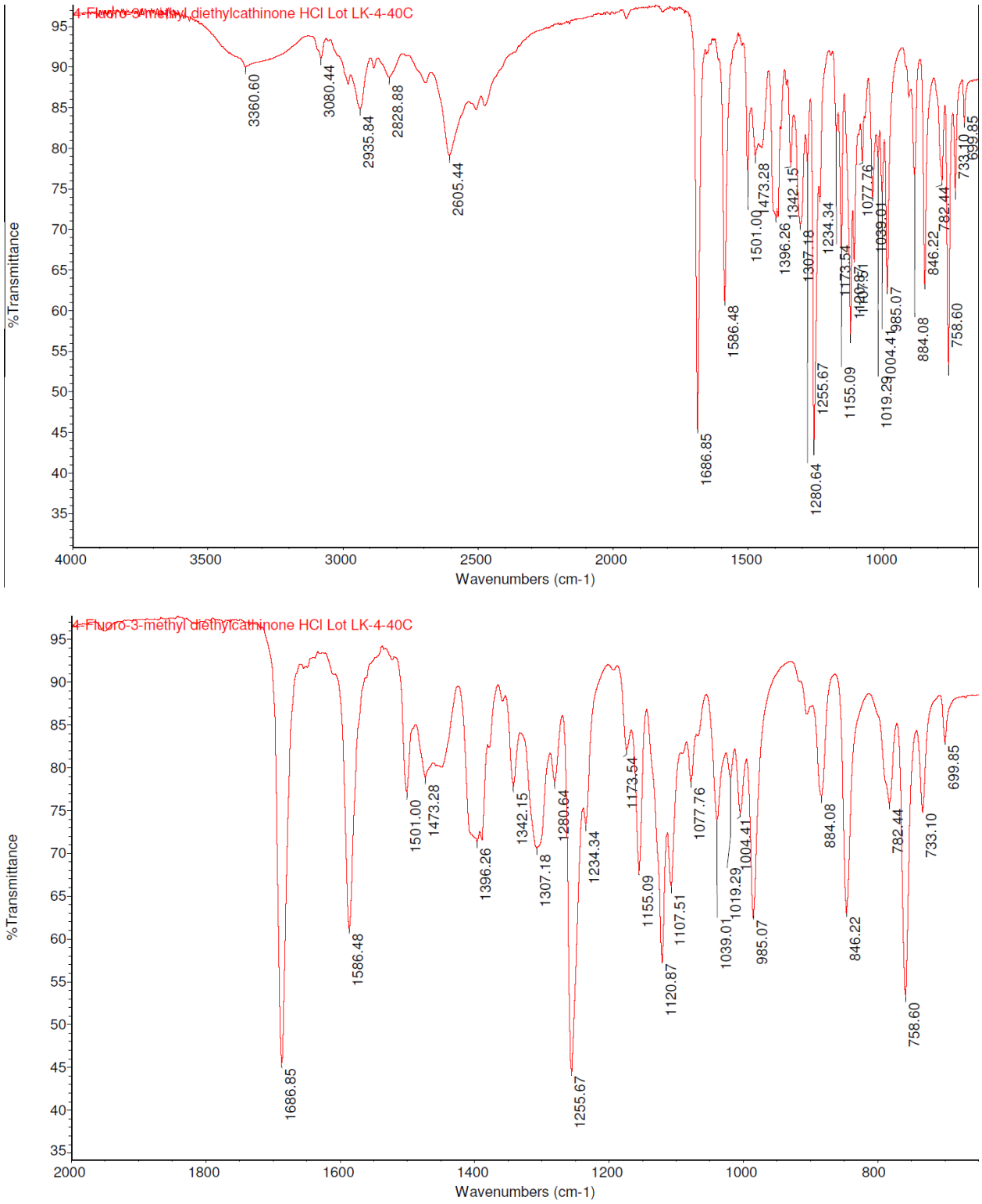


^{13}C NMR (126 MHz, DMSO-d_6) δ = 195.40, 165.05 (d, J = 253.7 Hz, 1C), 133.62 (d, J = 6.9 Hz, 1C), 130.28 (d, J = 3.3 Hz, 1C), 130.11 (d, J = 9.6 Hz, 1C), 126.19 (d, J = 18.0 Hz, 1C), 116.44 (d, J = 23.1 Hz, 1C), 61.72, 46.99, 45.20, 14.79, 14.55 (d, J = 3.3 Hz, 1C), 10.54, 9.04

^{13}C NMR spectrum of 4-Fluoro-3-methyl diethylcathinone hydrochloride (DMSO-d_6)



ESI-MS and ESI-MS/MS data for 4-Fluoro-3-methyl diethylcathinone hydrochloride



FT-IR (ATR) data for 4-Fluoro-3-methyl diethylcathinone hydrochloride

RECOMMENDED CITATION

Drug Enforcement Administration. DEA Overdose Surveillance Exchange (DOSE): New Substance Public Alert – 4-Fluoro-3-methyl diethylcathinone. Dulles, Virginia: US. Special Testing and Research Laboratory, DEA; 2026, July 23.

Click or scan QR code to contact and learn more about DOSE.