

30th tRNA CONFERENCE

tRNA 2026 · Scientific Programme

20–24 September 2026 · Aquila Atlantis Hotel, Heraklion, Crete

SUNDAY 20 September 2026

13:00	REGISTRATION	Registration opens	
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OPENING / KEYNOTE

CHAIRS: Constantinos Stathopoulos, Jinwei Zhang

17:00-17:10	Constantinos Stathopoulos Jinwei Zhang OPENING REMARKS	OC remarks on the 30th tRNA Conference	
17:10-17:50	Tsutomu Suzuki OPENING TALK	Expanding paradigms of tRNA modifications in health and disease	168
17:50-18:30	Zoya Ignatova KEYNOTE TALK	Expanding the functional landscape of tRNAs beyond translation into therapeutics	101
18:30-18:50	COFFEE BREAK		

S1. tRNA LIFE CYCLE AND ENZYMES I (SIDNEY ALTMAN ENDOWMENT SESSION)

CHAIRS: Vicky Stamatopoulou, Philippe Giegé

18:50-19:10	Eric Phizicky	An unexpected link between the biology of <i>S. pombe</i> Pus1 and the cytosolic iron-sulfur cluster assembly pathway	206
19:10-19:30	Carine Tisné	Advances in the structural and functional understanding of m1A tRNA modification	113
19:30-19:50	Markos Koutmos	Decoding context in tRNA modification: from Pus4 substrate gating to ALKBH8-driven oncogenesis	194
19:50-20:05	Artem Nemudryi	Bacterial Schlafen nucleases cleave tRNA to restrict phage infection	133
20:05-20:20	Cassandra Hayne	Novel insights into the function and cellular roles of the human tRNA splicing endonuclease (TSEN) complex	148
20:30	WELCOME COCKTAIL		

S2. tRNA LIFE CYCLE AND ENZYMES II
CHAIRS: Hubert Becker, Jesse Rinehart

09:00-09:20	Karin Musier-Forsyth	Conservation and function of MSC-associated OB-fold/EMAP II domains	209
09:20-09:40	Osamu Nureki	Crosstalk between membrane and nucleic acids	218
09:40-10:00	Susan Martinis	Human colon cell migration and socialization induced by small RNA nucleotides	227
10:00-10:20	Ita Gruić Sovulj	Evolutionary remodeling of class I aminoacyl-tRNA synthetases for enhanced catalysis and non-canonical function	198
10:20-10:50	COFFEE BREAK		
10:50-11:10	Stewart Shuman	$2''\text{F-NAD}^+$ is a broad-spectrum tRNA 2'-phosphotransferase (Tpt1) poison that traps the enzyme on its abortive RNA-2'-phospho-($2''\text{F-ADP-ribose}$) reaction intermediate	165
11:10-11:30	Javier Martinez	Ashwin and FAM98 paralogs define nuclear and cytoplasmic RNA ligase complexes for tRNA biogenesis	151
11:30-11:50	Jirka Peschek	Structural and mechanistic insights into the fungal tRNA ligase Trl1	210
11:50-12:10	Michael Ibba	Homocysteine thiolactone from translation proofreading is an endogenous ligand for cell-cell signaling by the receptor SdiA	220
12:10-12:30	Leslie A. Nangle	ATYR0101: a platform-derived fragment of human aspartyl-tRNA synthetase targeting LTBP-1 to selectively induce myofibroblast apoptosis	199
12:30-12:45	Ambro van Hoof	Characterization of tRNA ligase (Trl1) function in pathogenic fungi and trypanosomes reveals the ligase domain of Trl1 as a promising drug target	143
12:45-13:00	Utz Fischer	tRNA-based chaperoning of protein complex assembly	203
13:00-13:15	Bernhard Kuhle	Molecular mechanism of human tRNA 3'CCA addition	110
13:15-13:30	Jay R. Hesselberth	Nanopore-enabled analysis of transfer RNA aminoacylation	187
13:30-14:30	LUNCH		

S3. tRNA MODIFICATIONS I

CHAIRS: Juan Alfonzo, Valerie de Crecy-Lagard

14:30-14:50	Rujuan Liu	Molecular basis of m1A58 distribution in cytoplasmic and mitochondrial tRNAs and its essential role in initiator tRNA maturation	211
14:50-15:10	Kozo Tomita	Repurposing translation factors into a composite tRNA-processing enzyme	147
15:10-15:30	Valerie de Crecy-Lagard	Diversity and evolution of wobble uridine modification pathways in bacteria and archaea	44
15:30-15:50	Andrés Palencia	Structural studies of leucyl-tRNA synthetases and applications for the development of novel therapeutics	60
15:50-16:05	Yi Zhang	Non-canonical mRNA editing by tRNA adenosine deaminases: determinants and mechanisms	15
16:05-16:20	Marta Walczak	Molecular insights into the human tRNA thiolation machinery	94
16:20-16:50	COFFEE BREAK		
16:50-17:10	Sebastian Glatt	Understanding human tRNA modifiers at the atomic scale	73
17:10-17:30	Ann Ehrenhofer-Murray	Queuosine modification of tRNAs: functional crosstalk with (m ²)i ⁶ A modification and role in neuronal development	9
17:30-17:50	Mark Helm	Redefining tRNA purity by in-gel hybridization	186
17:50-18:10	Djemel Hamdane	Dihydrouridine synthases as multifunctional redox-responsive epitranscriptomic enzymes	54
18:10-18:25	Dragony Fu	Sequential tRNA modifications drive structural remodeling of the anticodon stem-loop	229
18:25-18:40	Akiko Ogawa	Epitranscriptome signature of aging in mice and human	166

18:40-19:10	Flash talks I		
18:40-18:43	Zhaohang Feng	Structural basis of the CdiA-CT tRNase toxin in complex with translation factors and tRNA	155
18:43-18:46	Claudius Doktor	Breaking a long-standing dogma: Functional class II CCA-adding enzymes are present in Archaea	42
18:46-18:49	Jesse Leavitt	Transcriptome profiling reveals widespread import of nucleus-encoded tRNAs into mammalian mitochondria	136
18:49-18:52	Kezia Dobson	A nanopore-based high throughput biochemical assay for aminoacyl tRNA synthetase activity and specificity	190
18:52-18:55	Katharina Görlitz	Inactivation of Pus1 triggers tRNATrpCCA instability and increases fluoropyrimidine sensitivity in <i>Saccharomyces cerevisiae</i>	6
18:55-18:58	Victoria Mok Siu	Histidine supplementation stabilizes hearing and vision and improves growth in HARS1-related autosomal recessive disorder associated with Usher-like symptoms in a clinical trial	131
18:58-19:01	Eric J. Wolf	Application of a sequence-specific hyperthermophilic ribonuclease, Tth-MazF1 to tRNA modification mapping by mass spectrometry	23
19:01-19:04	Takayuki Ohira	Functional specialization of TmcA paralogs in ac4C modification and thermal adaptation of <i>Sulfolobales</i>	129
19:04-19:07	Ursula Toth	Structural and functional diversity of 2'-OH ribose tRNA methylation complexes across eukaryotes	150
19:07-19:10	Joël Roth	Global protein synthesis repression alleviates defects induced by hypomodified tRNAs in <i>Saccharomyces cerevisiae</i>	16
19:30-21:00	DINNER		
21:00	Poster session I		

S4. tRNA MODIFICATIONS II
CHAIRS: Stefan Maas, Eric Phizicky

09:00-09:10	Stefan Maas INTRO	Introduction of RNA Modifications Driving Oncogenesis (RNAMoDO) and other NIH programs	
09:10-09:30	Juan Alfonzo	Duplication and recruitment of the wybutosine pathway to mitochondria as a key step to organellar function	135
09:30-09:50	Richard Gregory	Defining functional tRNA landscapes and vulnerabilities in cancer	215
09:50-10:10	Beatrice Golinelli-Pimpaneau	A hydrosulfide channel connects cysteine desulfurase to the [4Fe-4S] cluster of D-type MnmA for tRNA anticodon sulfuration	132
10:10-10:40	COFFEE BREAK		
10:40-11:00	Jane Jackman	Harnessing the potential of 3'-5' RNA polymerases for chemical and biological applications	216
11:00-11:20	Stefanie Kaiser	Expanding the reach of tRNA mass spectrometry: low-input sequencing and parallel isoacceptor analysis	212
11:20-11:40	Francesca Tuorto	Molecular and biological functions of queuosine-tRNA modification	3
11:40-11:55	Peter Sarin	Queuosine-mediated antiphage defence mechanisms and phage-induced host tRNA cleavage in the marine bacterium <i>Shewanella glacialimarina</i>	53
11:55-12:10	Gyuhyeok Cho	Discovery and structural characterization of dual wobble tRNA 5-carboxymethylaminomethyluridine oxidoreductases in Gram-positive bacteria	102
12:10-12:25	Alexander Maman	Discovery of natural phosphorothioates and their writer machinery in archaeal tRNA	118
12:25-12:40	Igor Kaczmarczyk	Cryo-EM snapshots reveal reversible catalysis during tRNA modification	123
12:40-12:55	Group photo		
13:00-14:30	MENTOR/MENTEE LUNCH		

S5. tRNA IN TRANSLATION

CHAIRS: Michael Ibba; Hiroaki Suga

14:30-14:50	Sebastian Leidel	How tRNA and mRNA modifications talk to each other	191
14:50-15:10	Marina Rodnina	Translational ambiguity as a regulatory principle	25
15:10-15:30	Yoav Arava	Local protein synthesis in neurons mediated by aminoacyl-tRNA synthetase	184
15:30-15:50	Philippe Giegé	Specific features of plant mitochondrial translation, from ribosome assembly to translation initiation	24
15:50-16:05	Yury Polikanov	Sequence-specific trapping of EF-Tu/glycyl-tRNA complex on the ribosome by bottromycin	14
16:05-16:20	Crispin Miller	A tRNA regulatory nexus of cell-state-dependent protein expression	41
16:20-16:50	COFFEE BREAK		
16:50-17:10	Susan Ackerman	Sequence variation upstream of a cytoplasmic tRNA differentially modifies neurodegeneration induced by ribosome stalling	221
17:10-17:30	Jiqiang (Lanny) Ling	Ribosomal fidelity orchestrates the integrated stress response through ribosome stalling at wobble-dependent codons	222
17:30-17:50	Kristin Koutmou	Dihydrouridine tRNA modifications ensure ribosome frame maintenance during protein synthesis	200
17:50-18:10	Leoš Shivaya Valášek	A short-lived ribosomal life of a near-cognate tRNA? It could be extended, some people say!	45
18:10 -18:30	Babak Javid	The ribosome regulates its own infidelity	230
18:30-19:00	Flash talks II		
18:30-18:33	Caitlin Specht	An engineered glutamic acid tRNA for efficient suppression of pathogenic nonsense mutations	201
18:33-18:36	Keyede Oye	Prime editing-mediated conversion of an endogenous tRNA into a +1-frameshift suppressor qtRNA for disease-agnostic therapeutic genome editing	164
18:36-18:39	Eduardo Campos-Chávez	Integrative Framework Links Natural RNA Sequence Diversity to Structure, Dynamics, and Function Across Typical T-box Riboswitches	96
18:39-18:42	Rebekah M. B. Silva	tRNA-dependent DNA hypermodification pathways from bacteriophage	104
18:42-18:45	Grazia Marini	Multidimensional tRNA Profiling: an integrated framework for decoding translational regulation	90
18:45-18:48	Henry Moore	A Pipeline for Allele-specific tRNA-seq Analysis	174
18:48-18:51	Kaishi Iso	Structural analysis of the release mechanism of the SecM-mediated ribosome arrest by the ABCF protein YheS	48
18:51-18:54	Saskia Meier	The 3' tDR-Gly: A stress-responsive tRNA fragment influencing gene expression in Escherichia coli	61
18:54-18:57	Klementina Polanec	tRNAs as modulators of TDP-43 proteinopathy	188
18:57-19:00	Ana Queiroz	A synthetic genomic platform to study tRNA biology in mammalian cells	8
19:30-21:00	DINNER		
21:00	Poster session II		

S6. tRNA BIOLOGY & DISEASES
CHAIRS: Stefano Marzi, Susan Ackerman

09:00-09:20	Xiang-Lei Yang	Anti-5'-tRNA-His-GUG half autoantibodies identified in Jo-1-positive patients correlate with IFN α elevation	207
09:20-09:40	Zdeněk Paris	Codon-biased translation mediated by queuosine tRNA modification is important for the virulence of <i>Leishmania mexicana</i>	62
09:40-10:00	Oscar Vargas-Rodriguez	A specialized, auxiliary tRNA synthetase safeguards tRNA aminoacylation during stress	219
10:00-10:20	Eva Maria Novoa	Selective profiling of translationally active tRNAs and their dynamics under stress	226
10:20-10:50	COFFEE BREAK		
10:50-11:10	Paul Fox	EPRS1 goes mod(ification)	214
11:10-11:30	Mariana Igoillo-Esteve	TRMT10A deficiency-mediated tRNA fragmentation impairs insulin maturation in human pancreatic beta-cells	149
11:30-11:50	Erik Storkebaum	From pathogenetic insight to therapeutic approach: developing a tRNA gene therapy for Charcot-Marie-Tooth peripheral neuropathy	26
11:50-12:10	Sunghoon Kim	Substrate-driven rescue of LARS2 dysfunction suggests a therapeutic approach for Perrault syndrome	107
12:10-12:25	Raghu Chivukula	Polyglycine aggregates sequester the tRNA ligase complex via FAM98B and impair tRNA splicing in GGC repeat expansion disorders	34
12:25-12:40	Caroline Köhrer	Engineered tRNA medicines for stop codon disease: a modular platform for multi-tissue therapeutic development	127
12:40-12:55	Elena Piskounova	Mitochondrial tRNAs as non-canonical GCN2 ligands in stress signalling and metastasis	158
12:55-13:10	Patrick O'Donoghue	Mistranslation in human pan-genome cell lines inspires applications of suppressor tRNAs to medicine	152
13:10	LIGHT LUNCH		
14:00-19:00	Crete cultural sites EXCURSION – CRETAN DINNER		
20:00	Free evening		

S7. tRNA STRUCTURE, FRAGMENTS & INTERACTIONS

CHAIRS: Norbert Polacek, Dragony Fu

09:00-09:20	Todd Lowe	New stories decoding human tRNA gene evolution & function: integrating sequence, functional genomics, and population-scale evidence	228
09:20-09:40	Sandra Wolin	RNA chaperones in tRNA biogenesis	161
09:40-10:00	Ana Raquel Soares	Host tRNA modification dynamics during influenza A virus infection: implications for viral transcript decoding and cellular stress responses	35
10:00-10:20	Yun-Xing Wang	Structures of a T4 dimeric pre-tRNA-E. coli RNase P maturation complexes	225
10:20-10:50	COFFEE BREAK		
10:50-11:10	Norbert Polacek	Mechanistic insights into bacterial tRNA fragments during stress response	78
11:10-11:30	Zeynep Baharoglu	tRNA modification pathways shape stress responses in <i>Vibrio cholerae</i>	31
11:30-11:50	Anindya Dutta	tRF 3021a supports cancer cell invasiveness, apoptosis resistance and global protein synthesis	117
11:50-12:10	Stefano Marzi	Species-specific translation control in <i>Staphylococcus aureus</i> : initiation, decoding and tRNA specialization	185
12:10-12:25	Ruslan Afasizhev	tRNA walks into an editing complex	17
12:25-12:40	Rachel Robertson	The folding and structural dynamics of a tRNA-Arg-UCU isodecoder associated with neurodegeneration	59
12:40-12:55	Tong Zhou	Decoding tRNA fragmentation with emerging analytical strategies	30
13:00-14:30	LUNCH		
13:20-14:20	Todd Lowe CONCURRENT TUTORIAL	GtRNAdb3 Tutorials: new features of genomic tRNA databases and tools	

S8. tRNAomics & SYNTHETIC BIOLOGY

CHAIRS: Todd Lowe, Tsutomu Suzuki

14:30-14:50	Hiroaki Suga	Extensive genetic code reprogramming by flexizymes and applications	28
14:50-15:10	Jesse Rinehart	Engineering translation in genomically recoded organisms: old codons, new challenges	154
15:10-15:30	Rajan Sankaranarayanan	Chirality enforcement during protein biosynthesis and its evolutionary implications	167
15:30-15:45	Mark Akeson	tRNA isodecoder analysis using nanopore ionic current signals and deep learning	69
15:45-16:00	Patricia Chan	tRAX 2.0: comprehensive expression and modification profiling and integrated analysis of tRNAs and tRNA-derived RNAs	181
16:00-16:15	Isabel S. Naarmann-de Vries	Nanopore tRNA-sequencing: open solutions for (de)-multiplexing and modification detection <i>Sponsored by ELTA90</i>	234
16:15-16:45	COFFEE BREAK		
16:45-17:05	Ya-Ming Hou	Decoding tRNA modifications by 2-read nanopore direct sequencing	95
17:05-17:45	Anita Hopper CLOSING TALK	tRNA introns: novel small noncoding regulatory RNAs	204
17:45-18:25	Awards ceremony CEREMONY	C. Stathopoulos, J. Zhang, H. Becker. V. Stamatopoulou	
18:25-18:40	Closing comments-Presentation of the next tRNA Conference CLOSING		
20:30	GALA DINNER		