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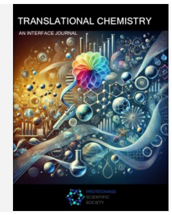

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Let There Be Light: Chemical Signatures and Translational Impact. Illuminating Translational Chemistry

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Chemistry has always had a singular vocation: to make the invisible visible. Among all the languages it employs, light holds a privileged place - not only as a tool for observation, but as a rigorous metaphor for the scientific process itself. Light is both messenger and method: it carries information, reveals structure, measures energy, exposes impurities, and confirms identities. And when chemistry becomes translational, light also becomes a bridge, linking a fundamental understanding of the universe around us to the solutions we implement in the real world. This First Issue in 2026 of Translational Chemistry is born from that conviction: translation is not an 'after' of science; it is a way of organizing it. To translate means to convert principles into decisions, mechanisms into measurements, signatures into diagnoses, reactivity into technology, and knowledge into benefit.

At the heart of chemistry lies the dynamics of electrons, and light is often the most direct route to interact with them. When a molecule absorbs a photon, it changes state; when it emits, it returns energy; when it scatters, it reveals order, bonds, symmetry, and heterogeneity. From this grammar comes an extraordinary capacity: to read signatures - spectral lines, vibrational bands, Raman patterns, fluorescence, chemiluminescence - and to turn those signatures into useful variables. A well-measured signature becomes a trustworthy number; a trustworthy number becomes a test; a test becomes a procedure; and a procedure, when robust and accessible, becomes impact.

Light connects the very distant to the very near: the composition of stars, interstellar clouds, and planetary atmospheres is inferred because atoms and molecules leave unmistakable optical fingerprints; Earth's atmosphere is monitored through the absorption and emission of trace gases; life itself uses pigments and cofactors as natural photonic devices. The 'universe around us' includes a nebula and a drop of urine, a surface-water sample and a tumor tissue - and in all these cases, light can be a privileged path for translating chemistry into actionable information.

That is also why the image of a 'spark' - an instant when energy and matter meet - remains so powerful for thinking about the origin and translation of chemical knowledge. Modern science studies, for example, how bursts of energy (light, electrical discharges, radiation, thermal gradients) can drive out-of-equilibrium chemistry and generate complexity: a 'flash' that is not myth, but a way of describing fast and decisive events in reaction networks. In the laboratory, synthetic chemistry has increasingly recreated plausible prebiotic scenarios and built minimal systems capable of generating or amplifying organization - not because life 'begins' in a single blaze, but because certain energetic regimes, however brief, can open reaction pathways and select products. In this view, light is no longer only what we observe: under certain conditions, it is also what makes things happen.

At a different scale, but with the same fascination, sonoluminescence reminds us that energy can be concentrated in extreme ways within a microscopic volume and manifest as light emission: a bubble collapses, a pulse emerges, a signal appears where we did not expect to 'see' light. The point is not to force simplistic parallels with cosmology; it is to recognize a common and profoundly chemical principle: local conditions can create excited states, generate reactive species, produce optical signatures, and convert energy into measurable information. In that sense, sonoluminescence functions as an echo - not literal, but conceptual - of the great questions about the origin of the universe: how energy organizes, how matter emerges in distinguishable states, and how physical information becomes inscribed in signals we can detect.

Translational chemistry thrives precisely here: in the ability to harness these principles and convert them into tools, from sensors and diagnostics to functional materials and sustainable processes.

It is at this point that an ancient cultural formulation - 'let there be light' - unexpectedly becomes a fertile editorial frame. Not as a scientific explanation, but as a metaphor that spans centuries: light as beginning, as revelation, as the separation between what is indistinct and what is measurable. Science does not replace the symbolic dimension; it dialogues with it by offering an operational language: Light → Signature → Interpretation → Decision/Intervention. Light is the interaction (absorption, emission, scattering) or the energy that triggers reaction; the signature is the measured signal; interpretation is the model that turns signal into concentration, structure, chemical state, phenotype, or risk; and decision/intervention is the destination of knowledge - diagnosis, environmental control, process optimization, therapeutic action, functional materials.

This translational line - from photon to impact - defines the spirit of this second year of Translational Chemistry: An interface Journal, and specially its firts Issue.

The thematic spectrum is broad, yet coherent. In health, we welcome optical and spectrometric methodologies applied to biomarkers and the exposome, rapid assays based on fluorescence or chemiluminescence, vibrational spectroscopies (IR/Raman) for screening and stratification, chemical imaging, and validation strategies in biofluids and tissues. In environment and safety, we invite portable platforms and sensors for emerging pollutants, screening approaches with analytical confirmation, solutions for sample pretreatment and interference mitigation, and integration with risk assessment. In energy and materials, we are interested in photocatalysis, energy conversion, green processes, and molecular design guided by optical properties. We also value contributions that explore fundamental mechanisms underpinning applications - fast dynamics, excited states, reactivity under locally intense conditions - because translationality here lies in explaining the ‘why’ that enables the ‘how’. Increasingly, we also emphasize the critical step that often determines the fate of a technology: moving from signature to meaning, where chemometrics, machine learning, mechanistic and hybrid models, cross-validation, and generalization across instruments and laboratories become essential.

This Issue is, above all, an invitation to think of chemistry as a discipline that both discovers and translates. Light - as tool, as phenomenon, as symbol - helps us bring physical chemistry, analytical chemistry, biochemistry, materials science, environmental science, engineering, and data into a shared narrative. By assembling diverse contributions under this guiding thread, we hope to stimulate unlikely dialogues and productive collaborations.

To authors, we ask for work that brings novelty, but also structure: clear hypotheses, reproducible methods, solid validation, and a narrative that explains not only what works, but why it works and what it is for.

To reviewers and readers, we thank you for sustaining the standard that makes science truly translational: the commitment to rigor, clarity, and usefulness. May this Issue contribute to a chemistry that illuminates - in the literal and the broadest sense - the universe around us, from questions of origins to the solutions the present requires.