

Estd. 1999

# NEWSLETTER

BE THE KEY PLAYER IN LIFE SCIENCES-DIAGNOSTICS & DRIVE INNOVATION FOR MAKING A HEALTHIER WORLD.

Customer  
Centric  
Innovation

Key  
Achievements  
& Milestones

Upcoming  
Industry  
Events

Yashraj  
Research  
Foundation  
(YRF)  
Initiatives

EST: 1999  
NAVI MUMBAI, INDIA

2015  
BERLIN, GERMANY

2018  
DELAWARE, USA



# Customer Centric Innovation

## Case study on Oxalate Oxidase production and assay development

Oxalate or Oxalic Acid is a metabolic breakdown product of the Krebs's Cycle in eukaryotes. Oxalate oxidase (EC 1.2.3.4) aka OxO is an enzyme that degrades oxalate and is thus used in commercial urinary assays to measure oxalate levels. OxO plays an important role in healthcare for oxalate-related diseases. Roughly, 80% of kidney stones are calcium based, and the majority of these contains a mixture of both calcium and oxalate. While oxalate is produced endogenously within the liver from ascorbic acid and collagen metabolism, up to 90% of urinary oxalate originates through gut absorption from the diet, especially from oxalate-containing plant-based foods (e.g., spinach, bran, leafy greens) or plant products (e.g., chocolate, almonds, peanut butter). Assessing oxalate in urine is a critical step for treating and monitoring kidney stones. However, large-scale production and reliable activity assays remain critical challenges.

One of Yashraj Biotechnology's long term customer sought support to develop OxO. Customer also proactively shared product specifications and highlighted challenges faced in procuring it from global partners.

To address this, YBL's R&D team made extensive efforts to produce recombinant OxO using E. coli and Pichia expression hosts, where we could express the protein and purify it, however, the expected enzymatic activity was not obtained. Through a series of expression trials, strain engineering, process refinements, protocols were optimized for both bacterial and yeast-based production. This led to an increase in enzyme yield, but activity remained a challenge. When YBL shared this information with the customer, they went on to confirm and got similar response from even leading R&D labs from couple of well-known organization in USA.

To extend further YBL R&D started germination of Barley seeds and conducted a large-scale localization and expression study. This approach which was followed to go out of comfort zone and do something which was never done before. At YBL we literally, did farming (in labs of course!) to serve our customer's unusual demand.

Finally, eureka moment came in where we could achieve expression, localization, purified enzymatically active protein.

Post extraction the sample was sequentially purified using various ion exchange and size exclusion chromatographic techniques yielding a highly pure and active final product. The concentrated and desalted sample was then analyzed on in-house modified enzyme assay and quantified on Oxalate oxidase assay kit. The in-house qualitative assay was based on oxalate's consumption reaction that produces a colored product ( $\text{Oxalate} + \text{O}_2 \rightarrow \text{CO}_2 + \text{H}_2\text{O}_2$ ). Purity and activity results are given in figure1.

***This work represents YBL's approach towards challenging product development and serving customers by developing tailor- made solutions.*** As we report this, the product datasheet and sample were submitted to customer to try in their assays.

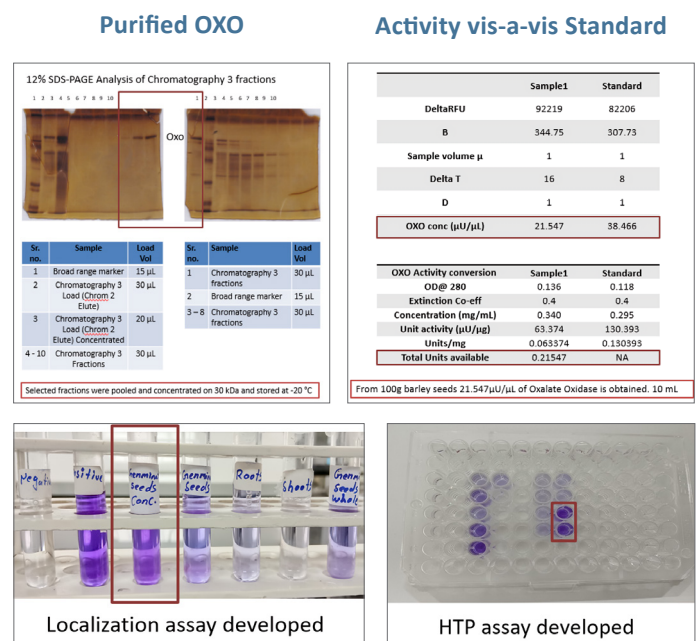


Figure 1: Characterization of YBL's OxO from Barley

# Co-culture of skin cell and iPSC derived sensory neurons

## A 'Disease in a Dish Model' for hyperpigmentation studies

The Integrated Drug Discovery and Development (IDD) team at Yashraj Biotechnology Ltd. is investigating developing a co-culture model that mimics a hyper pigmented disease condition. The hyper pigmented cells can be utilized in cosmetic industries for depigmentation studies. The study is focused on using in-house iPSC cell line (YBLi 001-A) to derive matured sensory neurons (SN) and grow them in co-culture with in house developed human skin-derived melanocytes (NHEM).

Skin melanocytes and sensory neurons originate from the same lineage of neural crest cells and their association in hyper pigmented disease condition is still being explored. There are reports which suggest that certain factors are released from sensory neurons which act as cues to aberrant pigmentation patterns in melanocytes.

In our study, iPSC-derived sensory neurons were allowed to develop over a period of 20 days; at the end of their maturation phase, the spent media was collected and used for growing melanocytes. The sensory neurons

were immuno-stained for SN-specific markers such as Peripherin and BRN3A (Fig1). Sensory neurons were then co-cultured with melanocytes and allowed to grow for 48 hrs. (Fig.2), following which process length of melanocytes was measured.

The melanocytes were also grown independently under sensory neuron condition media (SN-CM) to investigate the phenotypic changes in them as well as assess the changes in viability and pigmentation of the melanocytes. Cell viability was measured using Calcein AM with fluorescence as a readout, and cells were assayed for their melanin content using the MCA method. Both intracellular and extracellular melanin content assessments were performed, and initial findings reveals that extracellular melanin content (Fig.3) showed a steep rise in the presence of 50% and 100% of SN-CM. This increase in extracellular melanin content suggests the presence of some factor responsible for extracellular vesicle transport of melanosomes, supporting the role of sensory neuron condition media in regulating hyperpigmentation.

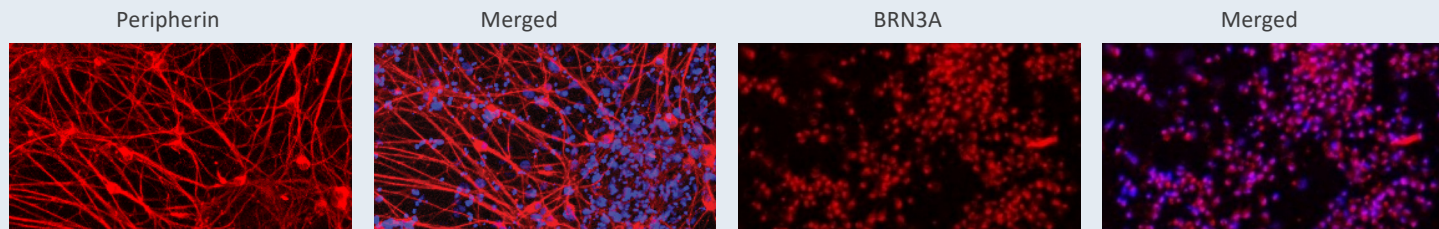


Figure 1: Immuno-stained images representing matured sensory neurons

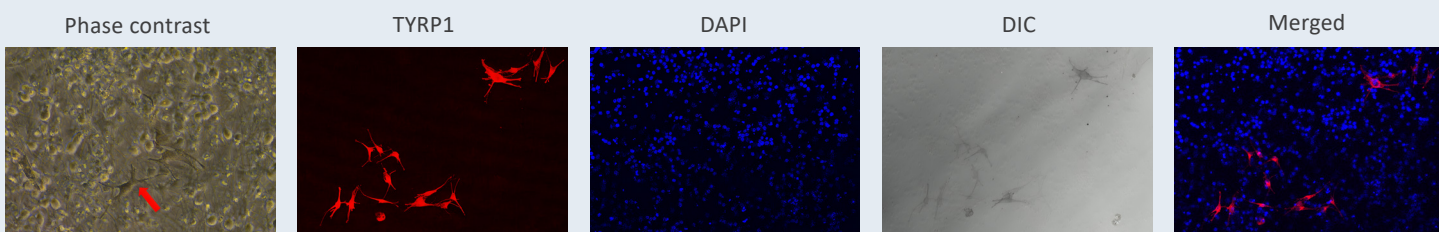


Figure 2: Co-culture of skin melanocytes and sensory neurons

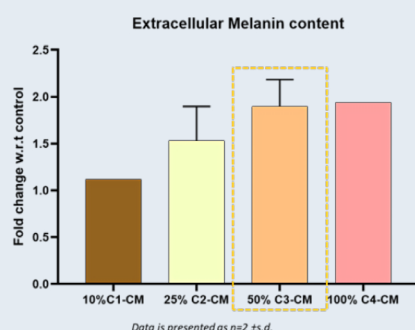


Figure 3: Extracellular melanin content when cells are primed with sensory neuron condition media at various combination.



# A high-ranking Indo-German delegation visits YBL facilities

On February 7th, 2025, a High-ranking German delegation representing Baden-Württemberg visited Yashraj Biotechnology Ltd. Navi Mumbai facilities. The delegation was led by Dr. Nicole Hoffmeister-Kraut, the State Minister for Economy, Labour, and Tourism and included State Parliamentarians and the Press.

Leadership team of YBL, Dr. Paresh Bhanushali & Dr. Amit Khanna welcomed the visitors and discussed the MedTech, Biotech and Life Sciences segments in India at

length. Team YBL also highlighted its commitment towards ethical research and the progress made in Non-Animal Methods (NAMs) for Drug Discovery.

Shri. D.K. Jain, Executive Director and Shri. Arvind Bhanushali, Chairman were also present in the meeting and discussed about the possible collaboration opportunities with Dr. Nicole Hoffmeister-Kraut.

We're excited about what the future holds!





## Yashraj Biotechnology is now officially a Great Place To Work®

It is with immense pride and gratitude that we announce Yashraj Biotechnology Ltd. has been qualified for the Great Place to Work® Certification from January 2025 to January 2026 in mid-size organisations category. This achievement is a reflection of our shared commitment to fostering a positive and high-performing workplace culture.

Great Place to Work® is a global authority on workplace culture. Their mission is to help every place become a great place to work for all. Their recognition is the most coveted and respected in the world for elevating employer brands to attract the right people.

Learn more at <https://www.greatplacetowork.in/> and on LinkedIn, Twitter, Facebook and Instagram.



# Customer Centricity

## The core at Yashraj Biotechnology

At Yashraj Biotechnology, customer centricity is our top priority. We are committed to our customers at every step, from providing high quality antigens and antibodies to a commitment that goes beyond just business.

### Things we do

- **Frequent visits** - We visit our customers 2 to 3 times every year to discuss in detail their changing needs and receive feedback on our services.
- **Trade Fair engagements** - We exhibit in international trade fairs such as CACLP, Medica and ADLM to meet customers, share ideas and introduce new products.
- **Regular interaction with our R&D Team** - We arrange virtual meetings to connect YBL scientists with our customers. This help us to understand product performance, provide technical insights, and develop custom solutions tailored to their needs.
- **Swift support** - It is our policy to respond quickly and provide solutions to customer queries and ensure that our customers' projects stay on course.
- **Facility visit** - We believe in developing long term relationships and therefore it is our practice to welcome our customers to YBL facilities to demonstrate the infrastructure and the dedication to quality, innovation and transparency.



## Conference Participation

Yashraj Biotechnology recently participated in one of the world's largest IVD trade fairs - CACLP 2025, held from 22<sup>nd</sup> to 24<sup>th</sup> March at the Hangzhou Grand Convention & Exhibition Center, China.

The event provided an excellent platform to team YBL for connecting with clients, partners and industry professionals from across the globe.

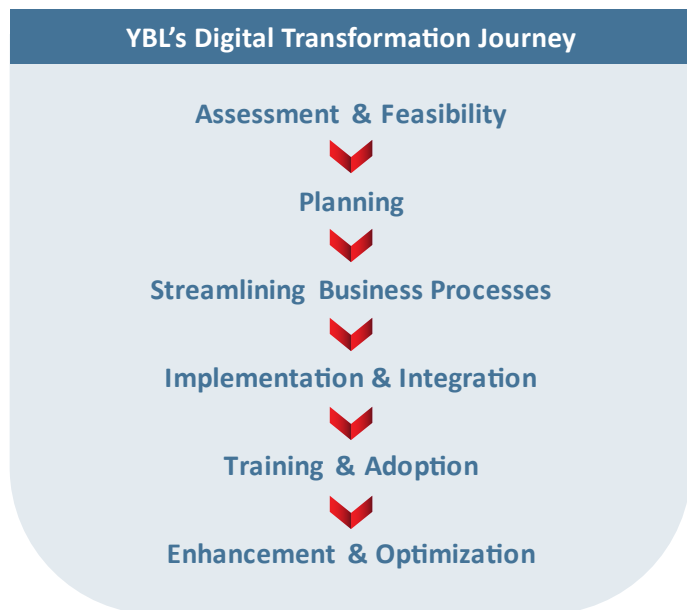
We thank everyone who visited our booth.





# Impact of Digitalization

Digital transformation 2.0 (DT) in YBL was kicked-off with a strong purpose at its core being a knowledge company. That, digitalization should be human-centric ensuring technology serves people - Our customers, partners, stakeholders & employees rather than other way around. Not as easy as it sounds yet YBL's DT team moved forward with determination, staying true to the organization's mandate for digitalization of all critical functions by FY 2026-27.



This involved designing a strategic roadmap keeping business in front that outlined how YBL could transform its processes, culture, systems, and governance to harness the power of data for decision-making, operational efficiency, and innovation. It meant usage of data not just as an asset but as a core component of its decision-making process, enabling it to gain competitive advantages, optimize operations and improve customer experiences. DT initiatives in YBL cuts across Business functions like - R&D, QC, QA, Production, Marketing, Operations, SCM and Enabling functions like - Finance, HR and Engineering.

As part of DT initiative, a modern brand new website was launched in November 2023 for improving customer experience. All experiments in YBL are captured in ELN with 100% audit trail for traceability - a measure of accountability for our customers. RM application, handling BMF provides real time information of the quantity and quality of all fluids for effective planning and fulfilling Production demands. End to end digitalization of Goat farm has driven significant productivity of entire upstream processes with real time data 24x7, where transaction volumes are very high. Digitalization of COA is a humble initiative that will enable our customers to read COA of our products over a click on the QR code anytime, anywhere. Our ability to handle customer enquiries, feedback, customer complaints, business analytics and other DT initiatives is a testament of becoming a customer first organization.

DT is one of the key initiatives in YBL with a clear mandate to



## Ensure Cross-Functional Integration

Cohesive functioning of R&D, Manufacturing, Commercial and Supply Chain.

## Lean Approach

Every DT initiative is championed by mapping the business processes first to be sure of desired outcomes. Visual project management & Lean tools drive efficiency avoiding back and forth, saving organizational time.

## Testing & Adoption

We flex execution of every project depending on complexity and user readiness for the change. Testing takes priority as this provides learning opportunity to business users and DT team ensures all business critical use cases are delivered as expected.

## Data-Driven Decision Making

DT initiatives are focused around facilitating data ingestion in BI systems aligned with business goals for real impact supported by AI/ML algorithms. It's a culture of data-driven decision-making for sustainable innovation.

## Building a Digital Culture

Upskill employees & drive digital adoption across teams.

## Security

Commitment for implementing ISMS leading to ISO 27001:2022 encompassing Data, Network & Applications.

**At YBL, our commitment to digital excellence ensures that we serve our customers better, work smarter & build a healthier world**

## Raising the voice of rural communities - Exposure Exchange Program

Team YRF had arranged a learning visit for Yashraj Biotechnology Limited (YBL) members to Anwir village on February 7, 2025, team YBL had the lifetime experience of visiting Anwir village, It was an experience filled with learning and exploration, where team YBL got to witness key rural development projects such as bridge construction, sustainable farming, and small scale entrepreneurship, to engaging with students through classroom visits and traditional games. The visit was a great way of fostering strong and meaningful connections, learning and a common cause of rural empowerment.



## A fun & learning picnic for tribal students

Team YRF arranged a picnic for Z.P.P. School, Anwir Rayatpada. The students visited Daman Airport where they got the opportunity to witness a helicopter take-off and landing along with a learning session on aviation. Afterwards, they had a great time at the sea side too, making some wonderful memories. A day of learning, joy and experience.



## Empowering farmers with organic solutions

Team YRF is training farmers to make Jivamrut, a natural fertilizer that helps in organic farming and reduces the use of chemicals along with improving the soil health. This initiative promotes sustainable agriculture and assist farmers in producing better quality crops with less environment impact.





## Products, Solutions & Services

### In-vitro diagnostics (IVD)

- Native Antigens
- Polyclonal Antibodies (pAbs)
- Molecular Diagnostics (Kits)
- Recombinant Antigen
- Monoclonal Antibodies (mAbs)
  - Hybridoma (Animal based)
  - Antibody Phage Display (APD)
- Molecular Enzymes

### Integrated drug discovery & development (IDD)s

- iPSC cell lines
- YBLi Cardiomyocytes
- YBLi Hepatocytes

### Contract research and manufacturing

### Our Certifications



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