A FIELD READY BLOOD TEST FOR THE PRECISE MEASUREMENT OF **OXIDATIVE STRESS**

OxiDx Pty Ltd

A spin out from

PILL ASX:PIQ Proteomics International LABORATORIES LTD

&

THE UNIVERSITY OF WESTERN AUSTRALIA

A medical technology company at the forefront of oxidative stress analysis

Athletic monitoring

- Human and animal sports injury risk management and athletic performance testing
- Field-ready blood collection, cost-effective, high throughput laboratory-based assay

Precision medicine

- Growing demand from pharma and medical companies for oxidative stress testing
- Emerging opportunities in clinical nutrition, treatment monitoring and dose adjustment testing

Primary industry

- Routine testing of live export and stock production
- Monitor effects of changing conditions, handling and detection of pathogen invasion

Financial & Corporate

- Ownership - Proteomics International (66%), University of Western Australia (33%), Founder (1%)
- Patents in all major jurisdictions
- State-of-the-art capabilities with >$4M* invested in cutting-edge technology

*R&D work at university of Western Australia funded through government grants and commercial evidence and patent filing work to protect the IP done at PIQ:ASX

PIQ ASX:PIQ Proteomics International LABORATORIES LTD

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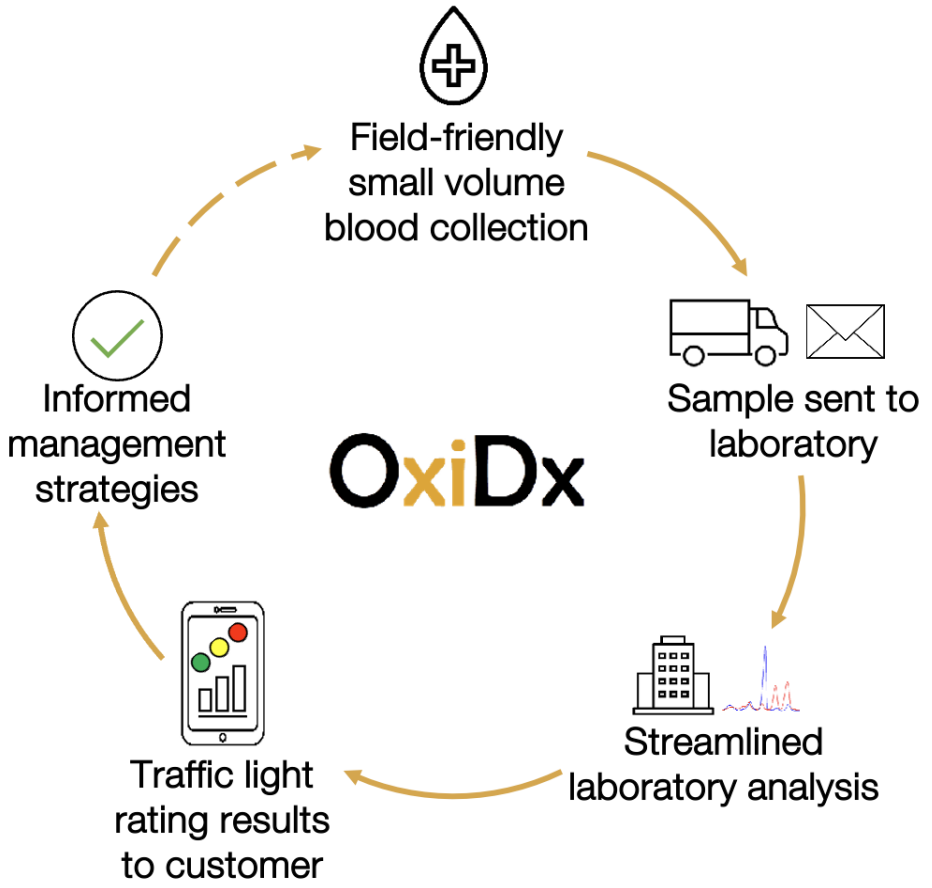
Test Overview

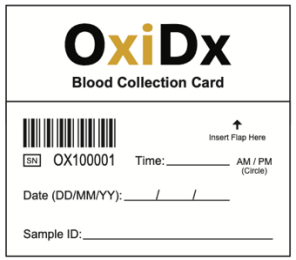
- ✓ Highly sensitive patented technology
- ✓ Fingerstick (human)/low volume (animal) blood collection permits rapid sampling by anyone, anytime, anywhere
- ✓ Cost-effective for sequential sampling and large cohort collection
- ✓ No cold-chain logistics or special mailing requirements
- ✓ Streamlined laboratory analysis allows results to be returned to customers within 12 hr
- ✓ Results feedback to inform management strategy – simple decision-making tool



Simple For Anyone, Anywhere, Anytime

Fingertip collection or small blood draw (<0.5mL)

Deposit 1 drop onto collection card



Courier samples to laboratory

Results in <24hr

- On-field sample collection in <1 minute (athlete/coach/trainer etc.)
- Blood samples are stable for up to 1 month and can be transported dry – bypasses expensive cold or frozen transport
- Laboratory analysis could be performed at or close to collection site (e.g. veterinary clinic)

Problem & Solution – Athletic Monitoring

The Problem

- Training or competing with insufficient muscle recovery (overtraining) results in poor performance and increases the risk of major muscle injury (e.g. tear)

Human Athletes

- 55% of all injuries are muscle injuries
- Injuries cost professional teams millions annually

Animal Athletes

- 85% of thoroughbred racehorses suffer an injury during their 2–3-year-old racing seasons
- Muscle injuries in thoroughbred horses are very difficult to diagnose – a significant proportion remain entirely undetected

Roadblock

Current standard-of-care

- Coaches use wearable GPS sensors and questionnaire surveys to assess their athletes – these cannot measure muscle recovery
- Horse trainers rely on highly subjective visual assessments to identify injury and assess muscle recovery from training and racing
- Cold chain logistics for traditional liquid venous blood samples is prohibitive

Solution

OxiDx standard-of-care

- An objective, dried blood spot test for overtraining, where the blood collection takes < 30 seconds
- Coaches and horse trainers can make informed decisions regarding training and competition schedules
- Preventable muscle injuries from overtraining no longer occur and athletes compete at peak performance

Muscle Injuries: A Brief Guide to Classification and Management
Sustainability and the Thoroughbred Breeding and Racing Industries: An Enhanced One Welfare Perspective

Assessing and Monitoring Muscle Recovery

OxiDx

OxiDx's sensitivity for muscle recovery surpassed traditional tests.

- Results from tests such as CK and muscle force capacity showed athletes returning to pre-marathon values by day 5.

Competing and/or training with oxidative stress can lead to underperformance and increased risk of injury.

OxiDx test applied to cohort of marathon runners.

- Baseline oxidative stress values established for every athlete
- Marathon race induced muscle damage with recovery in the days post-event
- Individualised monitoring to detect variability and prevent premature training or competition resumption
- Five athletes had prolonged recovery times (>7 days)

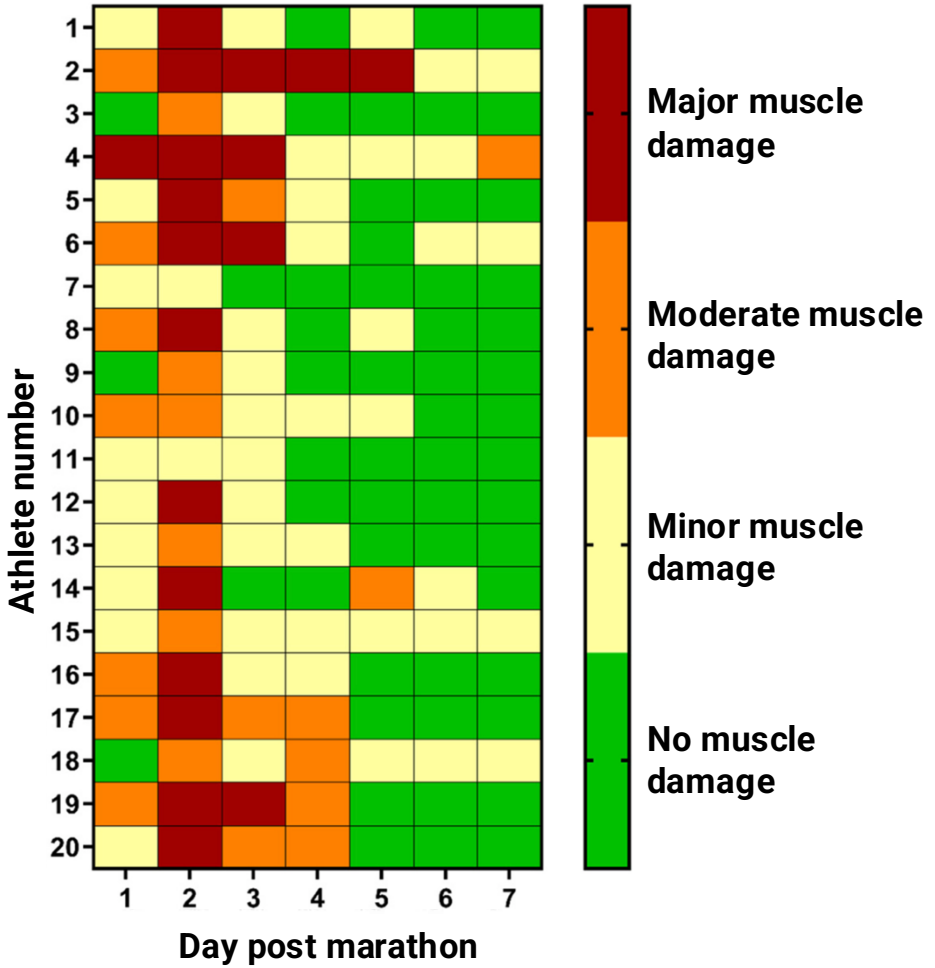


Figure 1. Heatmap depicting levels muscle damage identified using the OxiDx test for 20 elite runners each day after a marathon running race event.

James C, Lloyd EM, Arthur PG. Temporal changes in thiol-oxidized plasma albumin are associated with recovery from exercise-induced muscle damage after a marathon. Physiol Rep. 2024 Dec;12(24):e70155. doi: 10.14814/phy2.70155. PMID: 39730312; PMCID: PMC11679699.

Assessing Equine Oxidative Stress

OxiDx

OxiDx's sensitivity for muscle recovery surpassed traditional tests.

- Results from CK and AST blood tests showed horses returning to pre-race values by day 5.

Competing and/or training with oxidative stress can lead to underperformance and increased risk of injury.

OxiDx test applied to 34 WA thoroughbred horses

- Baseline oxidative stress values established for every horse
- Race induced oxidative stress with recovery in the days post-race
- Individualised monitoring to detect variability and prevent premature training or competition resumption.
- Five horses had prolonged recovery times (>7 days)

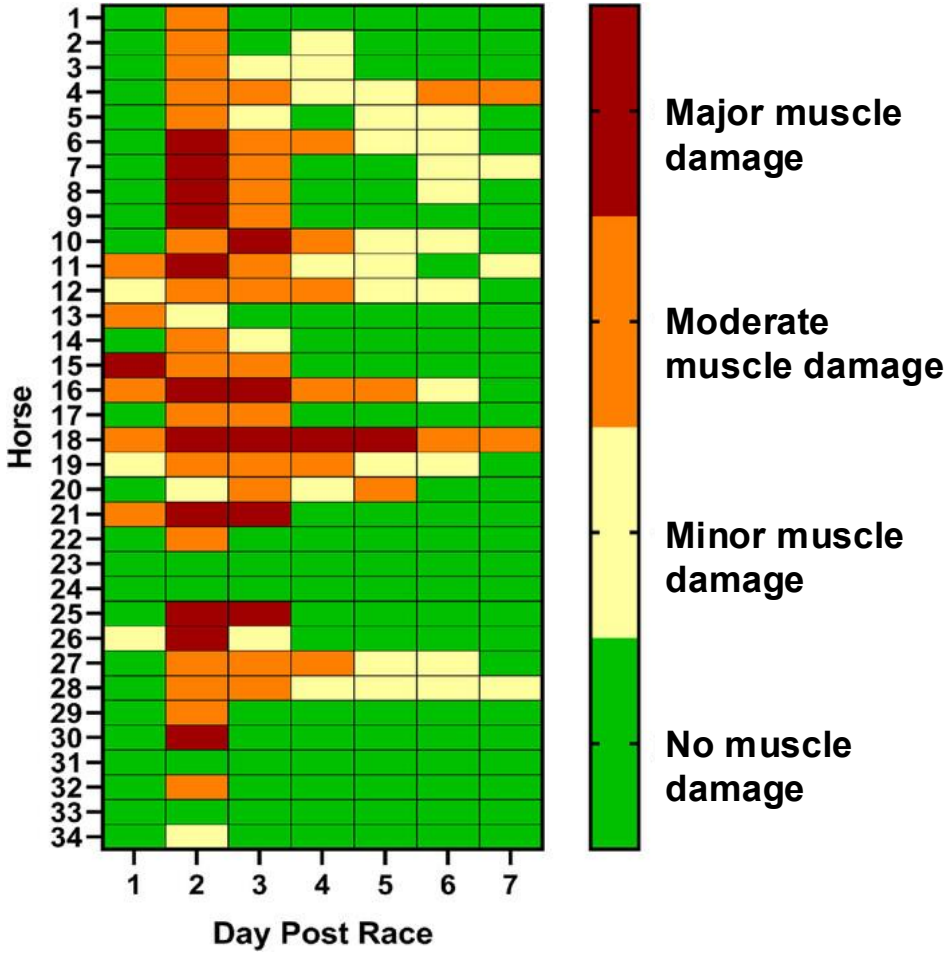
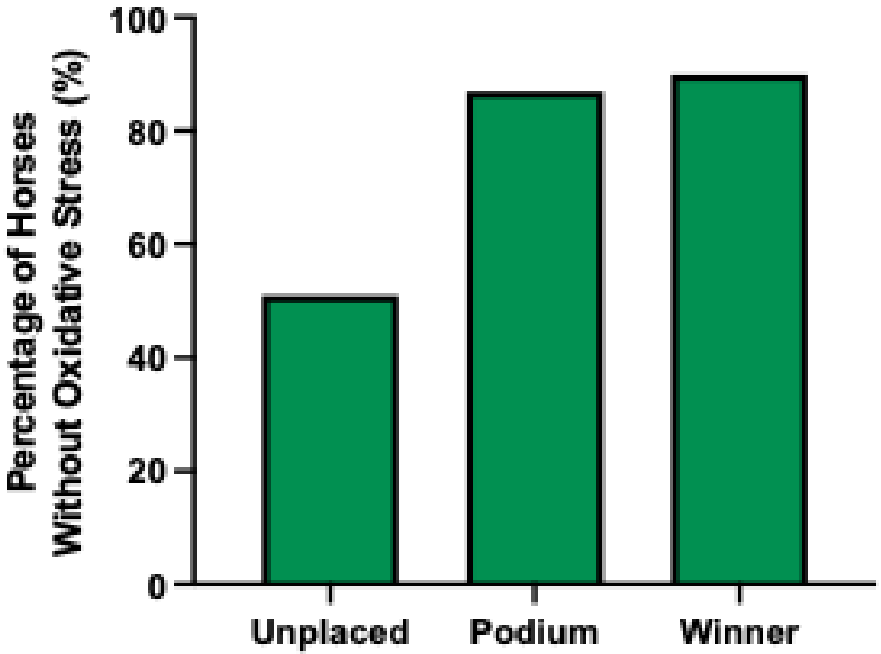


Figure 2. Heatmap depicting levels muscle damage identified using the OxiDx test for 34 thoroughbred horses each day after a race event.

James C, Lloyd EM, Arthur PG. Temporal changes in thiol-oxidized plasma albumin are associated with recovery from exercise-induced muscle damage after a marathon. Physiol Rep. 2024 Dec;12(24):e70155. doi: 10.14814/phy2.70155. PMID: 39730312; PMCID: PMC11679699.

Assessing Equine Performance



The percentage of horses who raced with oxidative stress and did not place, placed on the podium (2nd or 3rd) and won (1st). *n* = 124, 54 and 38 races from 75 individual horses for unplaced, podium and winner respectively.

- 75 individual horses tested over 216 competitive races
- OxiDx levels measured for full race campaign (up to 12 weeks/horse) + 48 hours before every race
- Each horse has a personal cut-off value - OxiDx levels above cut-off are indicative of oxidative stress
- **90% of winners** (1st) raced **without oxidative stress**
- **87% of podium** (2nd or 3rd) raced **without oxidative stress**
- **49% of unplaced** (4th - 12th) raced **without oxidative stress**

Racing Without Oxidative Stress = 49% more likely to win and 76% more likely to podium

James, C.; Sheahan, J.; Arthur, P. Stable Levels of Thiol-Oxidised Plasma Albumin, a Biomarker of Oxidative Stress, Is Correlated with Enhanced Performance in Australian Thoroughbred Racehorses. Animals 2025, 15, 3580. https://doi.org/10.3390/ani15243580

Key Publications

- **Papers 1, 2 and 3**
  - Demonstrate that competing without oxidative stress enhances performance
  - Detect muscle damage after a thoroughbred race (2), marathon race (3)
  - Identify different recovery timelines and those who do not recover
  - Outperform conventional tests for oxidative stress and muscle damage (e.g. CK, surveys)

- **Paper 4**
  - OxiDx is used in professional human sport as an effective tool to monitor the training load for athletes

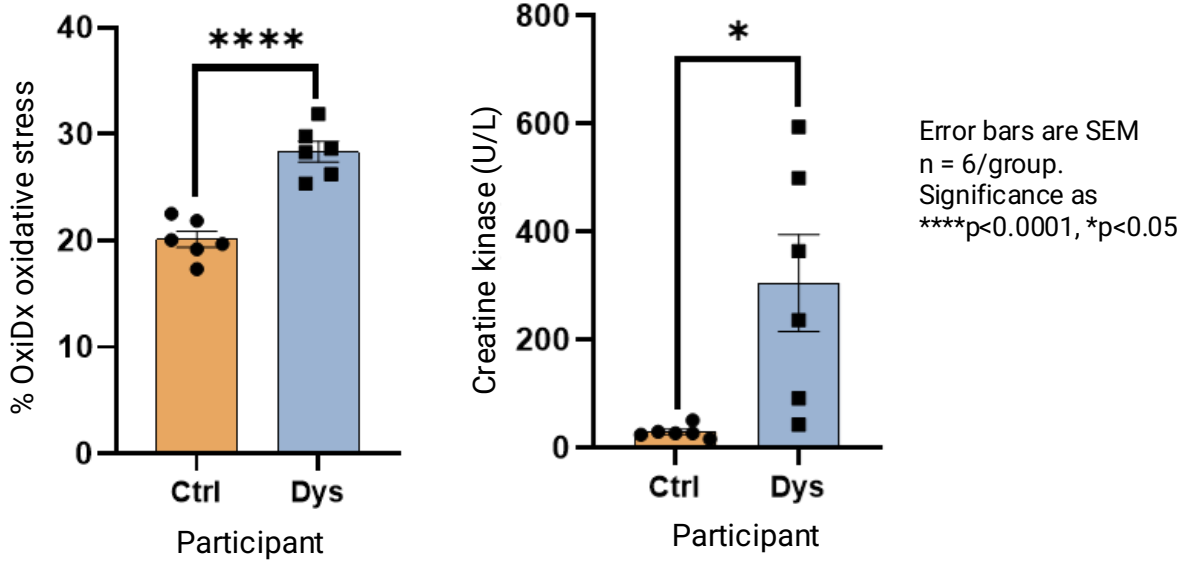
- Extensive foundation of additional peer reviewed studies in animal and human models of disease

1.	**Stable Levels of Thiol-Oxidised Plasma Albumin, a Biomarker of Oxidative Stress, Is Correlated with Enhanced Performance in Australian Thoroughbred Racehorses**	James, C.; Sheahan, J.; Arthur, P. Animals 2025, 15, 3580. https://doi.org/10.3390/ani15243580
2.	**The level of thiol-oxidised plasma albumin is elevated following a race in Australian thoroughbred horses**	James C, Lloyd EM, Arthur PG. Vet Med Sci. 2025 Jul;11(4):e70487. doi: 10.1002/vms3.70487. PMID: 40644475; PMCID: PMC12249229.
3.	**Temporal changes in thiol-oxidized plasma albumin are associated with recovery from exercise-induced muscle damage after a marathon**	James C, Lloyd EM, Arthur PG. Physiol Rep. 2024. Dec;12(24):e70155. doi: 10.14814/phy2.70155. PMID: 39730312; PMCID: PMC11679699.
4.	**The thiol oxidation state of albumin is associated with training load across an Australian football pre-season**	James C, Weber J, Boyde C, Fournier P, Arthur P. Oxid Med Cell Longev. 2026;2026(1):e5534194. doi: 10.1155/omcl/5534194. PMID: 41812060; PMCID: PMC12978576.

Pre-clinical Data Examples

1. Duchenne Muscular Dystrophy (DMD)

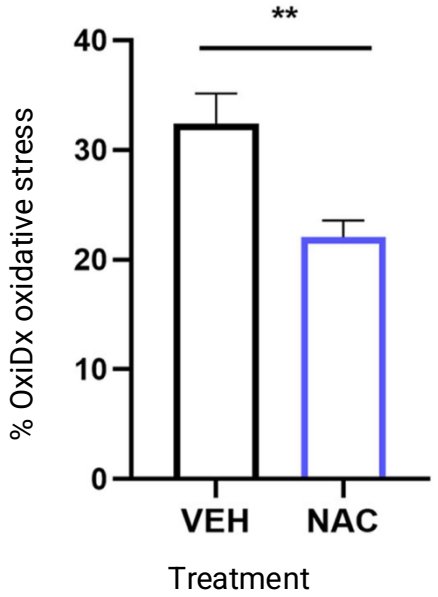
- 18- to -20 year old DMD (dys) and age matched healthy (Ctrl) male participants
- OxiDx detected significantly higher levels of oxidative stress in DMD patients compared to controls.
- OxiDx outperformed creatine kinase (common blood test) in sensitivity



Error bars are SEM
n = 6/group.
Significance as
****p<0.0001, *p<0.05

2. Effect of antioxidant N-acetyl cysteine (NAC) treatment after brain injury in mice

- Brain injury without treatment (VEH) increases oxidative stress
- Antioxidant treatment with NAC reduces oxidative stress



Error bars are SEM
n = 7/group.
Significance as **p<0.01

Data pending publication (2025)

Singh-Mallah G, Kawamura T, Ardalan M, Chumak T, Svedin P, Arthur PG, James C, Hagberg H, Sandberg M, Mallard C. N-Acetyl Cysteine Restores Sirtuin-6 and Decreases HMGB1 Release Following Lipopolysaccharide-Sensitized Hypoxic-Ischemic Brain Injury in Neonatal Mice. Front Cell Neurosci. 2021 Nov 15;15:743093. doi: 10.3389/fncel.2021.743093. PMID: 34867200; PMCID: PMC8634142.

Intellectual Property

Proteomics International owns two families of patents for OxiDx in key markets, with others pending

1) Title: "Methods for determining the redox status of proteins"

Derived from International Patent Application PCT/AU2006/001757

All patents valid until November 2026

Country/Region	Patent Number	Status
Australia	AU2006317506	Granted
USA	US8043824	Granted

2) Title: "Methods for measuring relative oxidation levels of a protein"

Derived from International Patent Application PCT/AU2019/050267

If granted, all patents projected to be valid until March 2039

Country/Region	Patent Number	Status
Australia	AU2019240758	Granted
Canada	CA3094249	Pending
China	CN112020650	Granted
Europe	EP3775927	Granted
India	IN202017044154	Pending
Indonesia	P00202007798	Pending
Japan	JP7325436	Granted
Singapore	SQ11202008979Q	Granted
USA	US2021041449	Pending

OxiDx maintains trade secrets and related know how as additional intellectual property

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