

COSMOGROUP · PULSE 1 · FOOTBALL

PRESS KIT

PULSE

BUILT FOR IMPACT

Discovering the biology behind human performance

PULSE

BUILT FOR IMPACT

Sport Science



Predictive Understanding of Load, Stress & Extremes

Petra Van Gucht
Carl Vandenbussche · Leigh Egger · Ruben Peeters

The same game. Different biology.

Petra Van Gucht · Carl Vandenbussche · Leigh Egger · Ruben Peeters

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01

KEY POINTS

PULSE in sixty seconds

A player who runs out of steam after seventy minutes. Two players with the same GPS data and a completely different recovery. Football is full of moments the numbers cannot explain. PULSE reads the biology behind them.

WHAT PULSE IS

- A book that reads elite football through a biological lens: the stimulus may be the same, the response is individual.
- The athlete as a living ecosystem: muscles, brain, gut, hormones, immune system, and the trillions of microorganisms we live with.

WHAT MAKES IT DIFFERENT

- AI and data show what happened. PULSE adds why this body responded this way, and helps shape what happens next.
- Each player is read against their own biology, not against an average.

SIMPLE TO APPLY

- Know the player once, read the day in one word, pull one lever: START, ADAPT, or PROTECT, and one of fifty Torques.
- It fits the Lean Six Sigma way of working in modern football: less noise, more understanding, better decisions.

Profile	Ω	CRAS	FLEX	RISE	BRI
six signals, one word: START · ADAPT · PROTECT					

WHO MADE IT

- Four people, four crafts, one friendship: Petra Van Gucht, Carl Vandenbussche, Leigh Egger, and Ruben Peeters.
- People with the same passion who found each other, and who still wonder at each other's expertise.

PART OF A TRILOGY

- PULSE 1 · Football is the first part of the PULSE trilogy, followed by Endurance and Tennis.
- Each part is a bundle: Built for Impact opens it, and dedicated books zoom in on Her Biology, Youth, Nutrition and Epigenetics, and the Science.

A · THE MOMENTS THE NUMBERS CANNOT EXPLAIN

IN BRIEF

- Every body writes its own response to the same training.
- PULSE was born from that observation, in the daily reality of elite football.

A player would consistently run out of steam after about seventy minutes. The familiar training methods to improve his endurance changed nothing. Only when the staff looked at what was happening inside his system did a missing piece appear: a lactose intolerance that had stayed invisible in the usual performance data. After adjusting his nutrition and monitoring him carefully, he lasted through the match. Ruben Peeters tells that story in the book, and calls it a defining moment.

Every performance staff knows a version of it. Two players complete the same match with almost identical GPS reports. One wakes up fresh the next morning. The other still feels heavy legs two days later. Training history, sleep, nutrition, metabolism, immune activity, and the body's network of microorganisms all shape how a match is absorbed.

What if we could read more of that biological conversation? That question sits at the heart of PULSE · Built for Impact.

B · THE BIOLOGY BEHIND PERFORMANCE

IN BRIEF

- Co-metabolism: our own cells and our microorganisms working as one living system.
- The gut is in constant dialogue with muscle, brain, and immune system.

Gut microorganisms ferment dietary fibers into short-chain fatty acids such as butyrate, propionate, and acetate. Butyrate feeds the cells lining the colon and keeps the gut barrier strong. Others take part in the metabolism of bile acids, amino acids, and vitamins. Host and microorganisms are in continuous chemical dialogue.

That dialogue reaches far beyond the gut. It shapes which nutrients reach the muscle, and when. It speaks with the brain through the vagus nerve, hormones, and microbial metabolites; most of the body's serotonin is made in the gut. During intense exercise, blood flow shifts away from the gut, and travel, heat, and time zones ask even more. Food carries information too: it feeds microorganisms and influences which genes are switched on or off, the field of nutritional epigenetics.

Muscle physiology, energy systems, biological clocks, metabolic flexibility, cognition, and lifestyle all lead back to one question in PULSE: how does this body adapt?

C · BEYOND DATA AND AI

IN BRIEF

- AI is excellent at processing what is measured. PULSE adds the living biology that produces every measurement.
- More data does not automatically bring more understanding. Biology gives the data meaning.

Almost every club today processes its medical and performance data with artificial intelligence: GPS, wellness, medical, and match data at a scale no staff could manage alone. That is a real strength, and PULSE builds on it. What PULSE adds is of a different nature: an understanding of the athlete as a living ecosystem, from genome and microbiome to metabolome, read person by person.

DATA AND AI	WHAT PULSE ADDS
Process what is measured	The biology that produces the measurement
Find patterns across many players	Read each player against their own biology
Grow with more data	Grow with more understanding: why does this body respond this way?
Explain what has happened	Help shape what happens next
Dashboards and alerts	One word and one lever, for one player, today

"Using science not only to explain what has happened, but also to help shape what happens next."

Carl Vandenbussche

Technology connects the information, biology gives it meaning, and the people around the player make the decisions. That combination cannot be downloaded: it grows from twenty years of research and years of shared work on the training ground.

D · LEAN SIX SIGMA IN MODERN FOOTBALL

IN BRIEF

- Lean: remove what adds no value. Six Sigma: understand variation before you correct it.
- PULSE brings both into football, with the biology of the player as the missing piece.

Lean Six Sigma is a way of improving any process step by step. It combines two simple ideas.

Lean	Keep what adds value and let go of the rest: unnecessary steps, waiting, double work, and information that changes no decision.
Six Sigma	Understand where variation comes from, so results become consistent and predictable. First understand, then correct.

Both ideas fit modern football remarkably well. Clubs collect more information than ever, yet the question that matters stays simple: what does this player need today? And two players with the same training show different responses. In football, that difference is not an error. It is biology. The aim is to understand it, and to remove the avoidable variation in our own way of working. Cosmogroup works with Lean Six Sigma in its own production environment, and the same thinking runs through PULSE.

Five steps, one cycle: DMAIC

Define	Name the real question. A player who fades after seventy minutes. Slow recovery in a week with three matches.
Measure	Measure what changes a decision, and add the biological baseline of the player.
Analyze	Look for the cause of the variation, inside the body as well as outside it.
Improve	Pull one targeted lever: a Torque, a change in timing, a nutrition adjustment.
Control	Follow the response over time with the six signals, and keep what works.

Ruben Peeters' story of the player who ran out of steam after seventy minutes is exactly that cycle: a clear question, a broader measurement, a hidden cause, a targeted change, and careful follow-up.

E · FOUR PEOPLE, ONE FRIENDSHIP

IN BRIEF

- Four crafts that fascinate each other: molecular science, daily performance decisions, the training field, and individual adaptation.
- They did not always agree, and that is exactly what made the book stronger.
- A collaboration carried by clubs, players, colleagues, and friends.

People with a shared passion have a way of finding each other. Leigh Egger met Petra Van Gucht at Feyenoord Rotterdam. Ruben Peeters first encountered the thinking behind PULSE at KRC Genk and Feyenoord, about eight years ago. Carl Vandenbussche found it through the collaboration between Cosmogroup and Club Brugge. Each time, the same thing happened: a scientist and a performance specialist started asking each other questions, and did not stop.

What started as a professional meeting became a friendship built on curiosity for each other's craft.

"No science grows in isolation. Over the years, I met remarkable people with the same fascination for performance and the same desire to understand what truly lies behind adaptation."

Petra Van Gucht

"She brought a complementary perspective. In addition to looking at what a player does, we began to explore the biology that helps determine how that individual player reacts."

Carl Vandenbussche

"Our conversations also opened up new ways of thinking for me, including the gut-brain axis and the way in which biological systems constantly influence one another."

Leigh Egger

"About eight years ago, I first encountered the thinking behind this book and experienced its practical value for myself."

Ruben Peeters

"Carl through the way he brings together structure, humanity, and practical application. Leigh by connecting science and practice without losing sight of the athlete. Ruben through his conviction that every plan holds another plan."

Petra Van Gucht, on what each of them brought

Everyone who made PULSE possible

PULSE is the work of many people who share the same proactive spirit, and every one of them left a mark on the book.

- The clubs that opened their doors and gave new ideas room to grow: KRC Genk, Feyenoord Rotterdam, and Club Brugge.
- The players who shared their experience, their questions, and their trust.
- Stijn Vandenbroucke, who brings his expertise to PULSE Science together with Ruben Peeters.
- Simon Mignolet, Joost van der Hoek, and Daan De Wever, who lent their voices to the book.
- Johan Lerno for his editorial contribution, and the Cosmogroup team in Eeklo, where research, nutrition, and production come together every day.

"I'd also like to thank Club Brugge and my colleagues for creating an environment where new ideas can be explored with both ambition and a critical eye, always with the same goal: developing individual players and competing for titles together."

Carl Vandenbussche

"In addition to them, I've met so many other fantastic people in sports who share this same proactive spirit. They, too, made this journey possible."

Petra Van Gucht

The people behind PULSE

Petra Van Gucht	Scientist in molecular health and epigenetics · co-founder and CEO of Cosmogroup
Carl Vandenbussche	PULSE ON PERFORMANCE · Individual Performance Coordinator, Club Brugge KV
Leigh Egger	PULSE ON PRACTICE · Physical Performance Lead, Socceroots · former Head of Performance, Feyenoord Rotterdam
Ruben Peeters	PULSE ON ADAPTATION · Head of Performance · a league title at each of three leading European clubs

F · PUT IT INTO PRACTICE

IN BRIEF

- Don't train harder. Don't take more supplements. Don't collect more data.
- Use the right lever, at the right moment, for the right player.

The science is deep. The application is simple. PULSE is written to be used on Monday morning, without an extra department or a new dashboard.

1 · Know the player	A biological baseline, built once and refreshed over time.
2 · Read the day	Six signals become one word: START, ADAPT, or PROTECT.
3 · Pull one lever	A Pomodoro for rhythm and timing, or a Torque: a small, targeted intervention with a far greater effect than its size suggests.

Fifty Torques

6

Breathing

6

Visual scanning and peripheral vision

6

Cognitive endurance

5

Sleep and recovery

5

Warm-up and activation

5

Nutrition and timing, food first

4

Adaptation and progression

4

Stress and regulation

3

Hydration

3

Safety and protection

3

Load management

50

Torques in total

Every chapter carries six reading tracks: the human story, the science, the output you can use in half an hour, the connection with existing expertise, the Pomodoro, and the Torque. Read it from cover to cover, or follow one track and you hold a book in its own right.

"An insight only gains value when it finds its way onto the training field, into the recovery plan, and into the choices a player makes throughout the day."

Leigh Egger

G · THE PULSE TRILOGY

IN BRIEF

- Three parts, three worlds of sport, one biological language.
- Each part is a bundle: one opening book and dedicated volumes that zoom in deeper.

1 PULSE 1 · FOOTBALL

Built for Impact

Performance through a biological lens. The opening part of the trilogy.

2 PULSE 2 · ENDURANCE

Beyond Limits

The same biology, in the world of endurance sport.

3 PULSE 3 · TENNIS

Power Under Pressure

The same biology, under the pressure of the individual game.

The PULSE 1 · Football bundle

01 BUILT FOR IMPACT

Performance through a biological lens

The opening book: the athlete as a living ecosystem, with football as the anchor and rugby, field hockey, basketball, and American football alongside.

02 HER BIOLOGY

The biology of the female game

Starts from the strengths of the female athlete: the unique build of collagen and muscle, the cycle as part of her biology, recovery, and nutrition.

03 YOUTH · BUILT TO GROW

The biology of the developing player

Growth, maturation, nutrition, and load, and how a thoughtful approach in the early years protects a career for the long term.

04 SCIENCE

The biology behind the game

The scientific reference behind the series, with expert contributions from Stijn Vandenbroucke and Ruben Peeters.

05 ON NUTRITION · FOOD FIRST

Nutrition and epigenetics, from gut to game

Food as a signal: co-metabolism, nutritional epigenetics, the gut under the strain of elite sport, and the road from youth to longevity.

H · FROM UNDERSTANDING TO APPLICATION

The books describe the biology. CosmoPulse is where Cosmogroup brings that understanding into the daily work of performance teams: a biological baseline of the individual athlete, followed over time and connected with the expertise of the coach and the medical staff. The decisions stay with the people who have always made them. Clubs and federations can get to know CosmoPulse at cosmopulse.eu.

I · MEDIA ESSENTIALS

Title	PULSE · Built for Impact · Sport Science
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Voices on PULSE

“Throughout my career, I have trained hard and, as a professional, often felt that numbers tell only part of the story. PULSE looks at that biological layer and helps people make more personalized, targeted choices.”

Simon Mignolet · Sporting Manager, Royal Belgian Football Association · former Belgium international

“In elite sport, the details matter. PULSE moves this forward with personalized analysis of the DNA-RNA-protein cascade.”

Joost van der Hoek, MD, PhD · Club Physician, Feyenoord Rotterdam

“PULSE did for me what it does for elite sports clubs and Olympians: it made the biology behind the moment visible.”

Daan De Wever · CEO and Co-Founder, Dstny Group

IMAGES AND PRESS CONTACT

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