

# **Resuscitec GmbH**

## **Category:**

Best Startup

## **Company Name:**

Resuscitec GmbH

## **Turnover and/or Funding:**

After spinning off from the University Hospital Freiburg in 2012, we at Resuscitec initially clinically and scientifically developed the CARL therapy, followed by the development of the CARL system as a dedicated device for in-hospital and out-of-hospital use of the CARL therapy. Our vision was from the beginning improving survival from refractory cardiovascular arrest and give patients the chance of neurologically intact survival anywhere in the world. In 2021, our CARL system received CE approval, followed by a PMCF study (with a significantly longer duration due to COVID) and, upon completion of the PMCF study, a limited market release in selected European countries. At the same time, we achieved technological independence through in-house developments of key components from upstream suppliers and established our in-house production. Since the beginning of 2025, a broad market execution has been underway, initially in the EMEA region. Market expansion into the US market and FDA approval are in preparation.

This corporate development was supported by international family offices and venture capital firms with approximately US\$ 85 million. The funds were provided as equity capital, convertible loans and traditional loans.

During the limited market release phase, we generated sales of approximately US\$ 2 million per annum. Based on the just started market execution in the EMEA region, sales of US\$ 6 million are already expected for 2025, US\$ 11 million for 2026 and US\$ 17 million for 2027.

Our business model is a classic Razer-Razer Blader business model based on an installed base of CARL systems in the markets and recurring, usage-based disposable sales.

We expect profitability from 2026 onwards.

## **Sub-Category:**

Medical Technology / Digital Health

## **Corporate history (creation, key milestones, main**

## **funding,...)Information on Condition / Disease and need for solution / product (prevalence, existing treatments / solutions):**

In the mid-90s, Christoph Benk and Georg Trummer were young. Full of hope. Full of ambition. We worked long nights in the Department of Cardiovascular Surgery at the University of Freiburg, treating patients in life-threatening situations. Despite the critical underlying conditions of the patients, we were often able to achieve good outcomes.

But there was one group that haunted us. Patients with sudden cardiac arrest, followed by CPR. Despite the full effort of our teams, these were the cases we almost always lost. And in the rare moments when someone survived... they often didn't return whole. Neurological damage was common. And irreversible.

The turning point came with a 40-year-old woman. She died suddenly in our ICU after cardiac arrest and CPR-just as her husband and children were calling, asking for her condition and if they could come visit. That loss was more than painful. It was a wake-up call.

We, together with our teams and the head of the department, Friedhelm Beyersdorf, gathered not just to grieve, but to act. We realized that cardiac arrest followed by CPR was not simply a resuscitation issue - it was a physiological challenge we hadn't properly addressed. The phenomenon of ischemia-reperfusion injury was almost completely overlooked in this context.

We began to question the dogma. Is it truly irreversible brain damage after 3-5 minutes without oxygen? As cardiovascular surgeons, we knew how to stop and restart the heart during surgery - and avoid damage. So why couldn't we apply the same logic to cardiac arrest? That was the beginning of the CARL Project.

CARL stands for Controlled Automated Reperfusion of the whole body. Supported by an NIH grant, we moved to UCLA in Los Angeles to test the idea in a chronic animal model. Big challenges don't wait for perfect timing. And CARL was no exception. We launched the project at UCLA in 2003 under demanding conditions. The model focused on survival and neurological recovery.

After a successful pilot, the funding ended - but we didn't stop. We couldn't. We brought the project back to Freiburg and, without formal funding, conducted preclinical experiments in pigs. Fifteen minutes of normothermic cardiac arrest - unprotected. And yet, full neurological recovery. Later we extended it to 20 minutes - with similar success. In our best experimental groups, 90% survived, and 90% of those showed total neurological recovery.

That convinced a broader community. We founded a startup, raised funding, and focused on building a portable, easy-to-use system - because we always believed treatment should start at the scene of cardiac arrest, not after long transport to a hospital. The spin-off company, Resuscitec, began in 2012. By 2021, we had developed and CE-certified seven medical devices designed to provide controlled reperfusion of the whole body.

## **History of the development of the solution/product (Intellectual Property, preclinical and clinical datas, development collaborations):**

A first clinical study followed in seven European centers. Even with the challenges of the COVID pandemic, it was a success. Among N=69 patients with cardiac arrest and no return of spontaneous circulation, 42% survived with intact brain function - mirroring the animal results. And among those connected to CARL outside the hospital, over 50% survived. Patients who, without CARL, would have died.

Moreover, one center using the CARL system published a case series of N=10 patients, who were treated with CARL in line with the above described study. They were also able to demonstrate superior results with 50% neurologic intact survival following out of hospital cardiac arrest.

Highly remarkable is one of our first CARL treatments in a 44-year old woman. She has been resuscitated for 120 minutes before it was possible to connect and treat her with CARL system. The subsequent survival and neurologic recovery of this patient demonstrated impressively the huge potential of CARL.

One may ask how CARL continued to evolve following these remarkable results. Since then, CARL has made its way into numerous hospitals and medical centers across Europe, with currently hundreds of patients treated. Parallel to that, we are currently initiating the process of FDA approval in order to meet the steady growing demand for this new therapy also in the US.

## **Why this drug or device is innovative, the broad implications for future research, and/or how it will improve the human condition:**

In summary, we have proof, that with this new, physiological approach to the condition of acute cardiac arrest and subsequent CPR, a new category of survivors emerged - challenging what medicine had accepted for over 60 years.

However, the idea, logic, and implementation of CARL offers multiple additional applications in other areas and many unmet challenges in modern medicine. At the core of this concept lies highly targeted and controlled perfusion of individual organs and the whole body to deliver drugs precisely to the area or tissue where they are needed. In fact, with the development of CARL, we didn't just overcome an old physiological limit - we unlocked a door that medicine had long assumed was permanently sealed.

What if death, as we understood it for decades, was not the end - but simply the limit of

what we once knew? Especially in cancer treatment, this technology holds the potential to transform paradigms: highly effective drugs, when combined with CARL's high-performance perfusion system, may multiply their ability to heal and to restore.

What began as a response to loss now stands as a gateway to saved lives - and to everything that is yet to come. Where others saw the end, CARL found the beginning.

**Please provide appropriate references (PubMed, Abstract, Website):**

This is the link to the homepage of the Resuscitec company:

<https://resuscitec.de>

Core publications regarding CARL are accesible here:

<https://www.mdpi.com/2077-0383/13/1/56>

<https://pmc.ncbi.nlm.nih.gov/articles/PMC9932608/>

<https://academic.oup.com/ejcts/article/50/6/1025/2726558?login=false>

[https://pmc.ncbi.nlm.nih.gov/articles/PMC5504811/pdf/13049\\_2017\\_Article\\_412.pdf](https://pmc.ncbi.nlm.nih.gov/articles/PMC5504811/pdf/13049_2017_Article_412.pdf)

A further selection of corresponding publications regarding CARL is related to Pubmed IDs ("PM ID") for

35194327

34290397

37965244

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20412965  
29125053  
30015357  
23885022  
28693585  
27261078

**References File Document upload:**

**[Trummer et al CARL Publication.pdf](#)**

**[Regensburg Series on CARL.pdf](#)**

**[Case report Survival after 120 minutes CPR with CARL.pdf](#)**