

The French brand C4Hydro is launching the **Mini-Lab**, the first pocket scientific laboratory! Used with the **Water Test** range for the fast detection of bacteria, it allows everyone to check the water in their system and to obtain a result fully independently in only 24 to 48 hours.



**Marseilles, July 2020** – A major breakthrough in controlling the health risk in water: C4Hydro, a specialist in the fast detection of bacteria in water, is launching its new Water Test range. It is intended for private individuals and for facilities which are open to the public such as hotels or campsites, who wish to be sure that their installation is free of contamination and that the users are safe.

All water systems and bathing locations can be colonised by pathogenic bacteria such as legionellae or coliforms such as *Escherichia coli*. They are the source of serious infections (legionellosis, acute gastroenteritis, meningitis, septicemia...). To respond to this health risk, C4Hydro has developed an innovative concept. The principle: take science out of the laboratories and widen access to the scientific tools in order to allow everyone to effectively check their water reliably, quickly and simply.

The innovation? The Mini-Lab, a pocket laboratory whose key element is a portable incubator. No larger than a smartphone, it reproduces the conditions of culturing microorganisms in a laboratory, which is the most reliable method of detecting bacteria. The technique is the same: C4Hydro has just simplified and adapted it for use by everyone, at home.

Having been designed by scientists with a background in the highest levels of French academia (CNRS: the French National Centre for Scientific Research) and redesigned for private individuals and professionals alike, two analysis kits are coming onto the market: the legionella detection kit and the coliforms detection kit (including *Escherichia coli*).

For more information, go to: <https://shop.c4hydro.com/our-products/?lang=en>

## This summer, keep an eye on bathing waters: fertile ground for the development of coliforms (including *E. coli*), which are bacteria indicating fecal contamination

Swimming pools – spas – beaches – water parks



(*E. coli* bacteria)

Each year, many hotels, campsites or water parks have to close their swimming pools due to contamination with coliforms (including *Escherichia coli*). These bacteria develop in the digestive tract of warm-blooded animals. Their presence in water therefore indicates a fecal contamination which is potentially dangerous to health.

Even though the most frequent contaminations are from human sources, in particular from young children, they can also originate from domestic or wild animals. In summer,

the period of greatest attendance, bathing waters such as swimming pools and spas, **even those which are chlorinated**, are the most affected by this bacteriological risk. Coliforms are also found during or after heavy rainfall. Flows of water can drain fecal contaminants, which end up in outdoor installations such as swimming pools, and also in wells and water tanks.

Contaminated water which is ingested or which comes into contact with the mucous membranes during bathing can be the source of food poisoning, acute gastroenteritis, bloody diarrhoea, meningitis, urinary infections, or even septicemia (a generalised infection which is fatal in 27 to 50% of cases). In young children, this can cause a haemolytic and uremic syndrome (HUS), a serious toxic shock which affects the kidneys and can manifest itself in an irreversible acute renal insufficiency.

➔ Despite the quality of the treatment of water guaranteed by the authorities, no installation is immune from accidental pollution and remains capable of being contaminated if it is not correctly maintained and regularly checked.



**Other dangerous bacteria have to be monitored. This is the case with legionellae, which are responsible for legionellosis. They proliferate in water systems and cause numerous deaths each year**

Showers – taps – spas – air conditioning – misters

Cases of legionellosis have increased by 220% since 2005 in Europe<sup>1</sup>. It is estimated that many tens of thousands of people are afflicted each year across the globe. This respiratory infection is fatal in 10% of cases. In vulnerable or elderly people, the mortality rate can reach 50%.

The culprits? The legionellae, those bacteria which develop in water systems which have a temperature between 25 and 45°C. Once inhaled via water vapour during a simple shower or a bath, they lodge themselves in the lungs until they produce acute pneumonia.

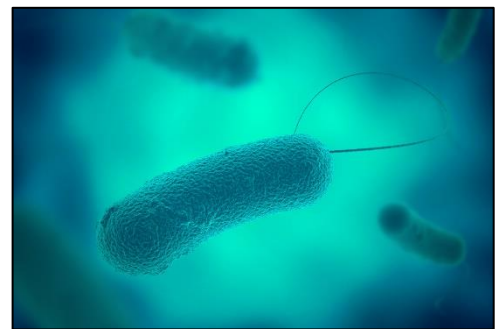
## Who is responsible in the event of an installation (shower, swimming pool, spas, air conditioning...) becoming contaminated with bacteria and users becoming infected?

Any landlord or owner of a building or an establishment which is open to the public bears civil and criminal responsibility if people are contaminated. The legislation can be more restrictive or less restrictive depending on the country and the levels permitted, but the risk of closure or financial penalties remains very high.

## In the event of closure to treat a contaminated system, the loss in terms of sales revenue and image can be considerable

When a contamination test gives a positive result, health authorities may decide to close an establishment for the duration of the treatment. The financial damage can reach many hundreds of thousands of euros depending on the size of the structure. By way of example, the administrative closure of the thermal baths in Rennes-les-Bains in France between 2007 and 2010 due to the presence of legionellae and the occurrence of two cases of legionellosis led to a loss of earnings amounting to 2,801,932 euros <sup>2</sup>, according to the local authority, and this is not counting the non-material damage to the establishment's reputation.

At the European level, there is a network called ELDSNET (European Legionnaires' Disease Surveillance Network) which surveys cases of legionellosis which are linked to travel. Its aim is to inform health authorities in the relevant countries of any cases of legionellosis occurring in people who have visited a tourist establishment in the country during the period of incubation, specifying the dates and locations of the visit. The aim is to identify cases in the European Union in order to invite the contaminated establishment to take appropriate checking measures. If the measures taken are not deemed by the health authorities to be satisfactory within the 6 weeks following the notification, the name of the establishment is listed on the public website of the ELDSNET<sup>3</sup> network. This site is accessible to the public and to businesses which organise and sell trips (tour operators).



*Legionella pneumophila* bacteria

## Faced with risk, the watchword is: prevention

According to the Centers for Disease Control (CDC) in the United States, **90% of legionellosis cases could avoided with a better prevention policy.**<sup>4</sup> Alas, when it is applied, the legislation only requires publicly accessible establishments to carry out just one test per year. This is far from sufficient, in the face of the real nature of the risk.

- ➔ In this context, regular testing of your water is vital. C4Hydro has developed its first two bacteriological detection kits to respond to this need. Due to their reliability, speed and simplicity, they make it possible to carry out regular monitoring of your installations fully independently, and to treat your water if necessary, BEFORE it leads to an infection.

## C4Hydro/DIAMIDEX, the cutting-edge microbiology for monitoring health risks



Based in Marseilles, the C4Hydro brand develops and markets bacteriological test kits for professionals and private individuals. Created in 2014 by **Sam Dukan**, former Research Director at CNRS (the French National Centre for Scientific Research), the company now has a staff of 30, including a team of doctors specialising in microbiology, immunology, molecular genetics, machine learning, life physics, etc...

The C4Hydro tests use **Diamidex® technology**, a major patented scientific innovation which emerged from excellent French academic research which has gained recognition both in France and internationally. This is proven by the numerous distinctions received, such as the La Recherche prize in 2015<sup>5</sup>, the mention in Faculty of 1000 of 2012 (listing the 1000 most important scientific discoveries each year, combining all scientific fields) and the cover of Angewandte Chemie in 2014.<sup>6</sup>

**Sam Dukan, the source of these discoveries, is available for interview.**

### How do the C4Hydro tests work?

The Water Test test range is based on the use of the Mini-Lab, a pocket laboratory in a small case, which must be combined with the desired analysis kit: the legionellae kit or the coliforms kit. The Mini-Lab contains two syringes and a mini-incubator which will incubate any bacteria sampled. During the incubation time, they will evolve in an enclosed environment which is favourable to their development and safe for the user, which is capable of revealing them. Like a true laboratory analysis, the procedure consists in simply taking a sample of water to be analysed and following a simplified scientific protocol. 20 to 30 minutes of handling are necessary to perform the test. After these operations, all you have to do is leave the incubator plugged into the mains for the recommended time, depending on the bacteria being tested: 24h for coliforms, and only 48h for legionellae, instead of 10 days in laboratories. The result is simple to read and operates either via the colouring of the sample (for the coliforms), or via the reading of a strip (for the legionellae).

The Water Test range is the only one to be based on the culturing of bacteria with an incubation cycle. This is an unprecedented, patented innovation which guarantees reliable results for both private individuals and professionals.



## Technical specifics of our tests

Name of the test:	Bacteria targeted:	Result in	Detected threshold	Dimensions
<b>Legionella Water Test</b>	<i>Legionella pneumophila</i> , of all serogroups	48 h	10 CFU* / mL (*Colony Forming Units per millilitre of water)	14,5 x 7,5 x 4,5 cm
<b>Coliforms Water Test</b>	Coliforms (including E. coli)	24 h	<1 CFU* / mL (*Colony Forming Units per millilitre of water)	14,5 x 7,5 x 4,5 cm
<b>Mini-Lab</b>	Equipment which can be reused with any test from the Water Test range. Contains a 110-240V - 50/60Hz incubator with a European adaptor (US and UK adaptors available).			22 x 17 x 8 cm

## CONTACTS

### C4Hydro / DIAMIDEX

Grand Luminy Technopole  
Zone Luminy Entreprise Biotech  
Case 922, 163 Avenue de Luminy  
13288 Marseille Cedex 09, France  
<https://shop.c4hydro.com/>  
<https://diamidex.com>

Press Relations  
Alice GREGOIRE  
[alice.gregoire@diamidex.com](mailto:alice.gregoire@diamidex.com)  
tel : 33 (0)6 15 29 99 47

### Sources :

<sup>1</sup> Europe Centre for Disease Prevention and Control, 2019, <https://ecdc.europa.eu/en/home>

<sup>2</sup> La Dépêche, La Mairie réclame 2,8 millions en réparation de préjudices [*The Town Hall Claims 2.8 million in Compensation for Loss*], February 2016 <https://www.ladepeche.fr/article/2016/02/11/2274652-la-mairiereclame-2-8-millions-en-reparation-de-prejudices.html>

<sup>3</sup> <https://www.ecdc.europa.eu/en/legionnaires-disease/threats-and-outbreaks/accommodation-site>

<sup>4</sup> <https://www.cdc.gov/vitalsigns/legionnaires/>

<sup>5</sup> <https://www.larecherche.fr/prix-la-recherche-ev%C3%A9nement/prix-la-recherche-2015-un-palmar%C3%A8s-dexception>

<sup>6</sup> <https://onlinelibrary.wiley.com/doi/10.1002/anie.201311062>