WHAT WE DO?

- YFLOW IS A NANOTECHNOLOGY COMPANY.
- USES ELECTRO-HYDRODYNAMIC (EHD) MICRO-FLUIDIC TECHNIQUES TO GENERATE FINE AND ULTRAFINE ELECTRIFIED COAXIAL MICROJETS (PATENTED TECHNOLOGY) OF TWO IMMISCIBLE LIQUIDS.
- CONTROLLING KEY PARAMETERS, NANOPARTICLES SUCH AS CAPSULES, HOLLOW SPHERES, HOLLOW FIBERS & COAXIAL FIBERS CAN BE FORMED.

HISTORY

1990

I.G. LOSCERTALES (UMA) AND ANTONIO BARRERO (US) STARTED WORKING IN EHD

2000

INVENTED THE COAXIAL ELECTRIFIED JETS TECHNOLOGY

2001

MICRO/NANO ENCAPSULATION VIA ELECTRIFIED COAXIAL LIQUID JETS.

2002

ELECTRICALLY FORCED COAXIAL NANOJETS FOR ONE-STEP HOLLOW NANOFIBER DESIGN.

2004

YFLOW SOLD THE FIRST EHD LAB EQUIPMENT

2005

YFLOW MOVED ITS HEADQUARTERS TO NEW FACILITIES AT THE TECHNOLOGIC PARK OF ANDALUCÍA (MÁLAGA).

2006

YFLOW SOLD THE FIRST PILOT SCALE EHD EQUIPMENT

2009

INVENTED THE COAXIAL ELECTRIFIED JETS TECHNOLOGY

CURRENT EMITTED BY HIGHLY CONDUCTING TAYLOR CONES.
EXPERIENCE IN EHD

- **PUBLICATIONS:** MORE THAN 40 IN ELECTRO-HYDRO-DYNAMICS
  - CURRENT EMITTED BY HIGHLY CONDUCTING TAYLOR CONES. *JFM* (1994).
  - ELECTRICALLY FORCED COAXIAL NANOJETS FOR ONE-STEP HOLLOW NANOFIBER DESIGN. *JACS* (2004)

- **REFERENCES:** MORE THAN 2000

- **PATENTS & LICENSES FILED:**
  - INTERNATIONAL PATENT PCT WO 02060275A1. PRODUCTION OF CAPSULES AND PARTICLES FOR IMPROVEMENT OF FOOD PRODUCTS. LICENSED TO ITS USE IN FOOD TECHNOLOGY.
  - MICROPARTICLES (FOOD GRADED). GB2487794.
  - METHOD FOR PRODUCING NANOFIBERS OF EPOXY RESIN FOR COMPOSITE LAMINATES OF AERONAUTICAL STRUCTURES TO IMPROVE THEIR ELECTROMAGNETIC CHARACTERISTICS, EP 08382075.3.
THE TECHNOLOGY

ELECTRIFIED JET

- A **LIQUID** solution with certain $K_{\text{ELECT}}$ flows through a capillary tube connected to a power source. $E_{\text{ELECT}}$ overcomes the surface tension of liquid, and the meniscus turns into **THE TAYLOR CONE**.

- From the tip of the cone appears a jet ($D_j$) that breaks up into **MONODISPERSE** droplets ($D_{\text{DROPLET}}$). Both are independent of the diameter of the needle.

- **SCALING LAWS** predicts: $D_{\text{DROPLET}}$ & $I_{\text{current}}$

- PRODUCTION OF MICRO AND NANOPARTICLES (SPHERICAL & FIBER-SHAPED) which diameters are in the range (10 nm – 10 mm).
PATENTED TECNOLOGY
ELECTRIFIED COAXIAL JETS


DIFFERENT NANO-STRUCTURES OBTAINED BY COAXIAL EHD TECHNIQUES
INDUSTRIAL APPLICATIONS
“MICROENCAPSULATION”

**PHARMACEUTICAL**
- CONTROLLED DRUG RELEASE.
- TISSUE ENGINEERING.
- NANO – METALLIC PARTICLES FOR SPECIFIC TREATMENT.

**BIOMEDICINE**
- TISSUE ENGINEERING
- WOUND HEALING.
- DRUG DELIVERY
- MEDICAL DEVICES

**COSMETIC, DETERGENTS & ADHESIVES**
- CONTROLLED RELEASE.
- MICRO/NANO EMULSIONS.
- ACTIVE MOLECULES PROTECTION.
- PARTICLES WITH HIGH SPECIFIC AREA FOR UV ABSORPTION.

**FOOD**
- SMART PACKAGING.
- SHELF-LIVE IMPROVING (ACTIVE PACKAGING).
- MICRO/NANO EMULSIONS.
- ENCAPSULATION OF BAD FLAVORS COMPOUNDS.
BIOPOLYMERS
NANOSTRUCTURED BY EHD TECHNIQUES FOR BIOMEDICAL APPLICATIONS

PLA

PVA

LIGNIN

ZEIN

CELULLOSE

MALTODEXTRIN
COLLABORATIONS
WITH WORLDWIDE ESTABLISHED COMPANIES

PRODUCTS
ELECTROSPINNING/ELECTROSPrAY LAB DEVICES

START-UP LAB UNIT
PROFESSIONAL LAB UNIT
INJECTORS
COLLECTORS
“APPLICATIONS ARE ENDLESS IMAGINATION IS THE LIMIT”