

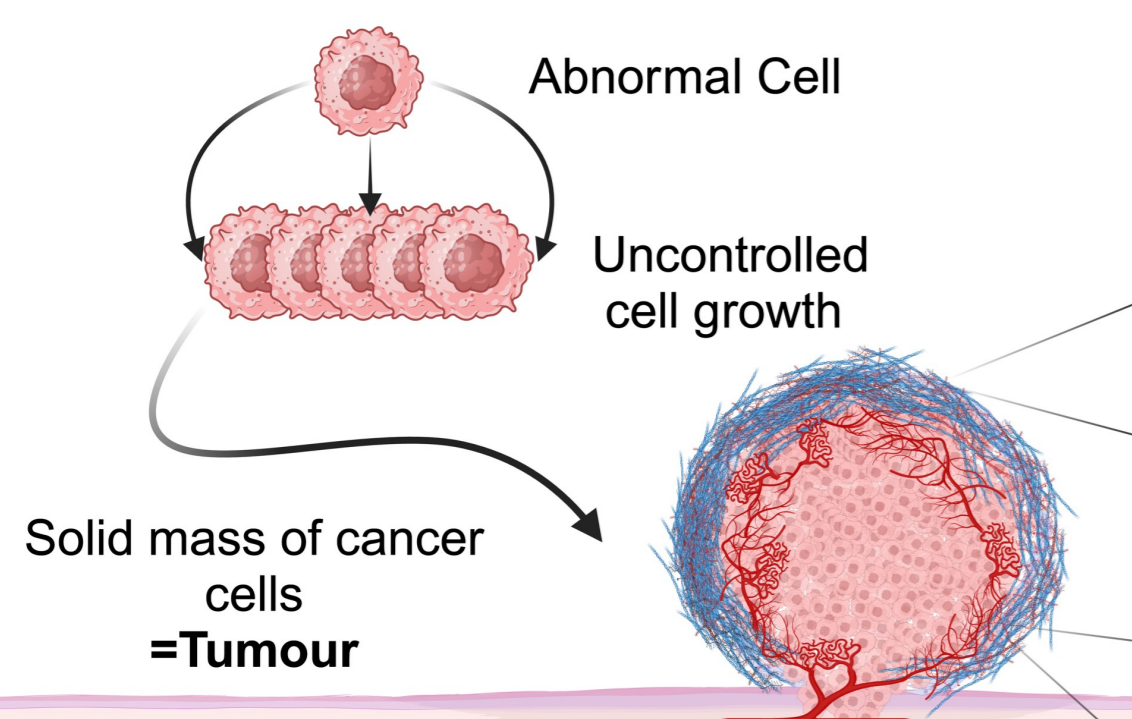
# Battling The Big C: Revolutionising Cancer Therapy Using Targeted Nanomedicines

*Kyle K. Greenland*, Damien A. Leach, James W. Hindley, Anabel Varela-Carver, Oscar Ces, Charlotte L. Bevan

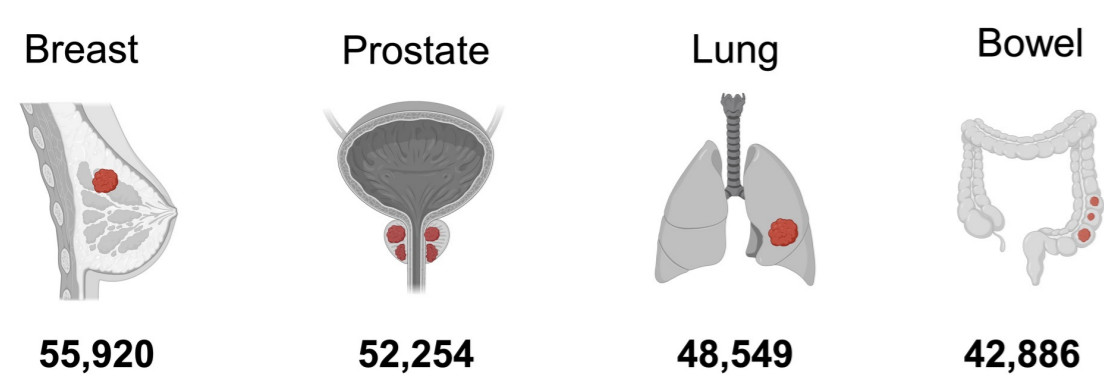


## Our Current Understanding

### What is Cancer?



In the UK, **1 in 2 people** will develop some form of cancer during their lifetime

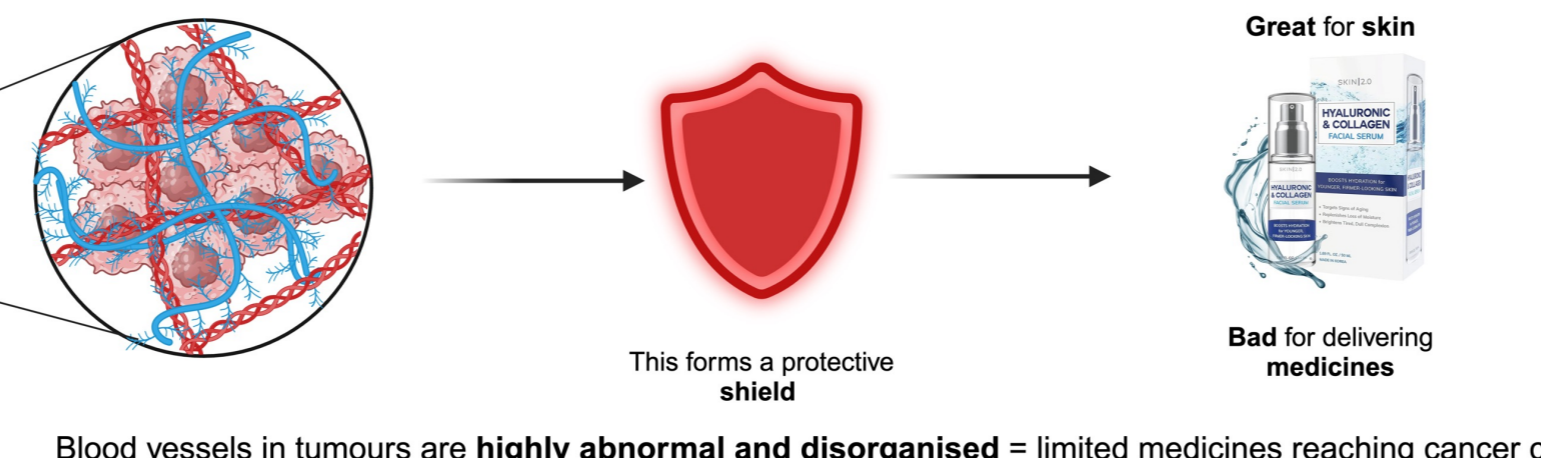


<sup>1</sup>New Cases in the UK Each Year

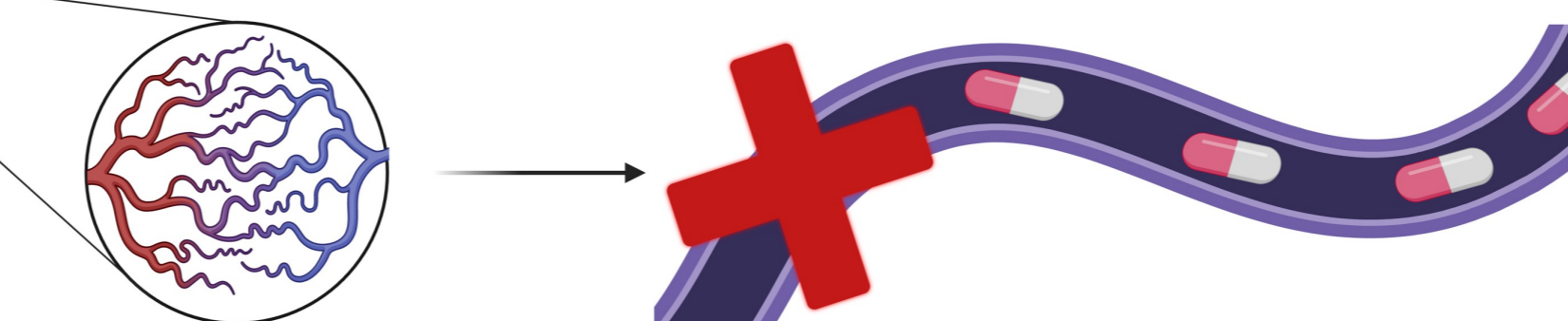
### The Challenges with the Current Approach

#### 1. Getting Medicines Into Tumours

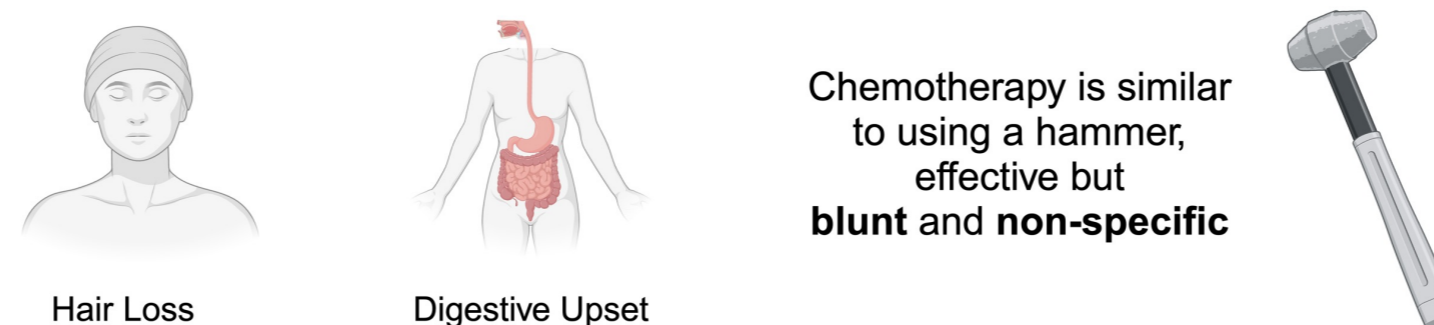
Tumours surround themselves in a dense network of collagen and hyaluronic acid that blocks medicines entering



Blood vessels in tumours are highly abnormal and disorganised = limited medicines reaching cancer cells

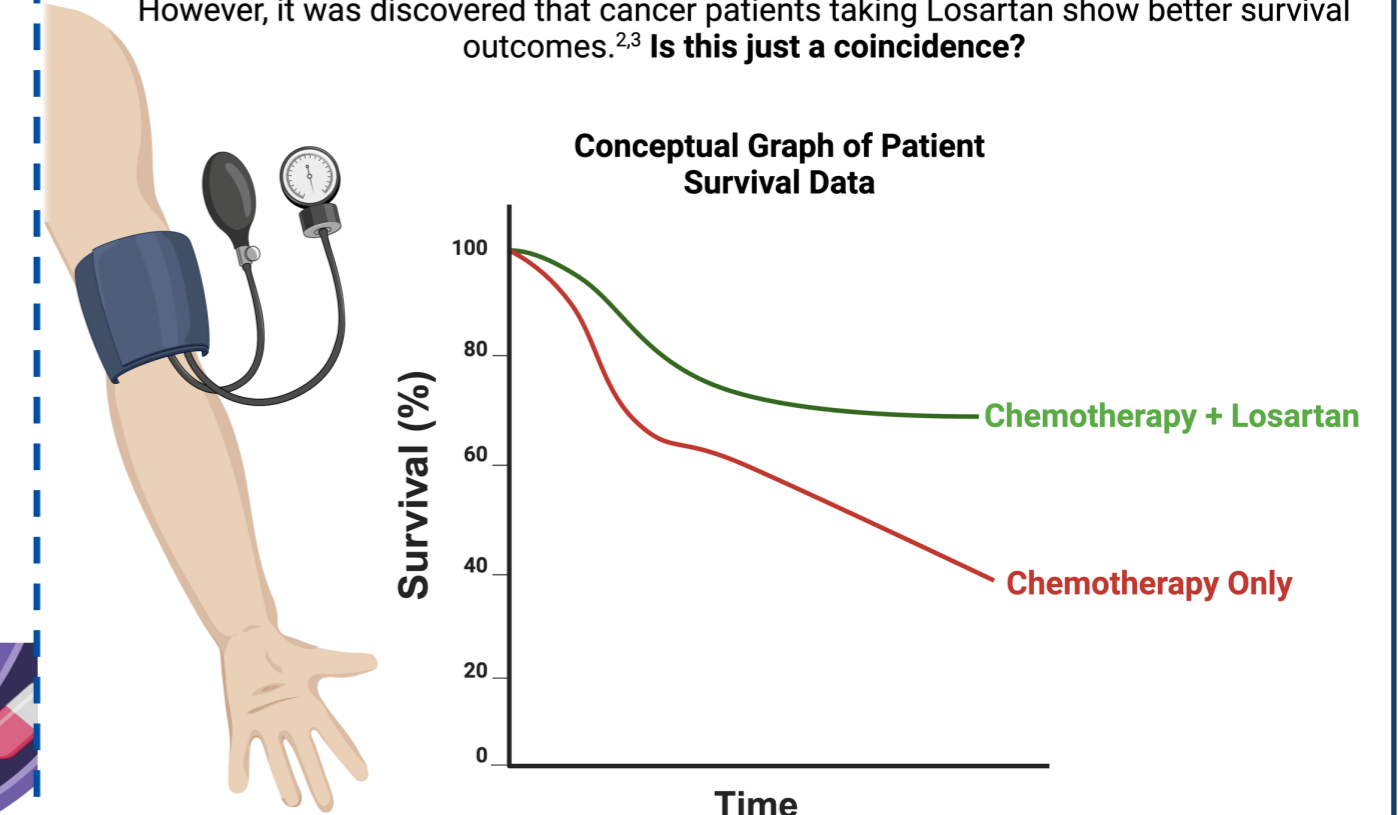


#### 2. Side Effects of Cancer Medicines Damaging Healthy Cells

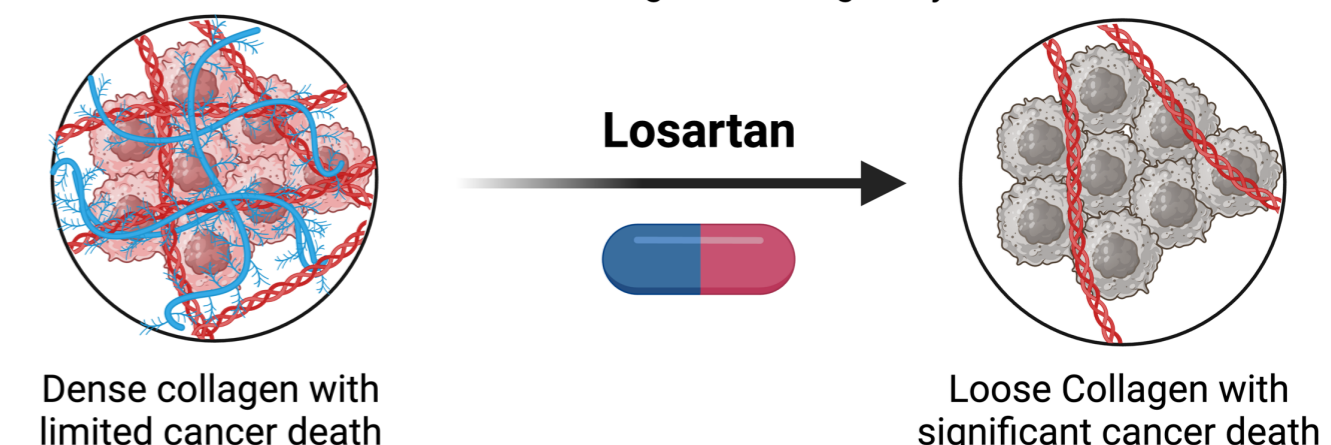


### Losartan: Old Dog, New Tricks

Losartan is an approved medication for the treatment of high blood pressure. However, it was discovered that cancer patients taking Losartan show better survival outcomes.<sup>2,3</sup> Is this just a coincidence?



**Our Hypothesis:** Losartan loosens the dense collagen network surrounding tumours, allowing better drug entry



## Our Approach: Engineering Liposomal Nanomedicines

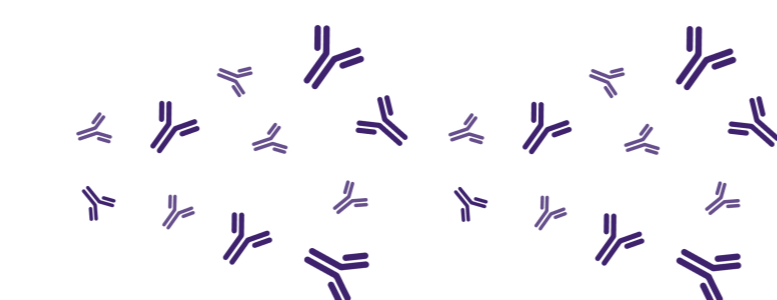
### Using Liposomal Nanoparticles for Delivering Cancer Medicines

#### What are Nanoparticles?

Nanoparticles are extremely tiny, typically ranging from 1-100 nanometers in size. To put this in perspective, this is **70 000 times** smaller than a strand of hair.

#### How can we use them in cancer treatment?

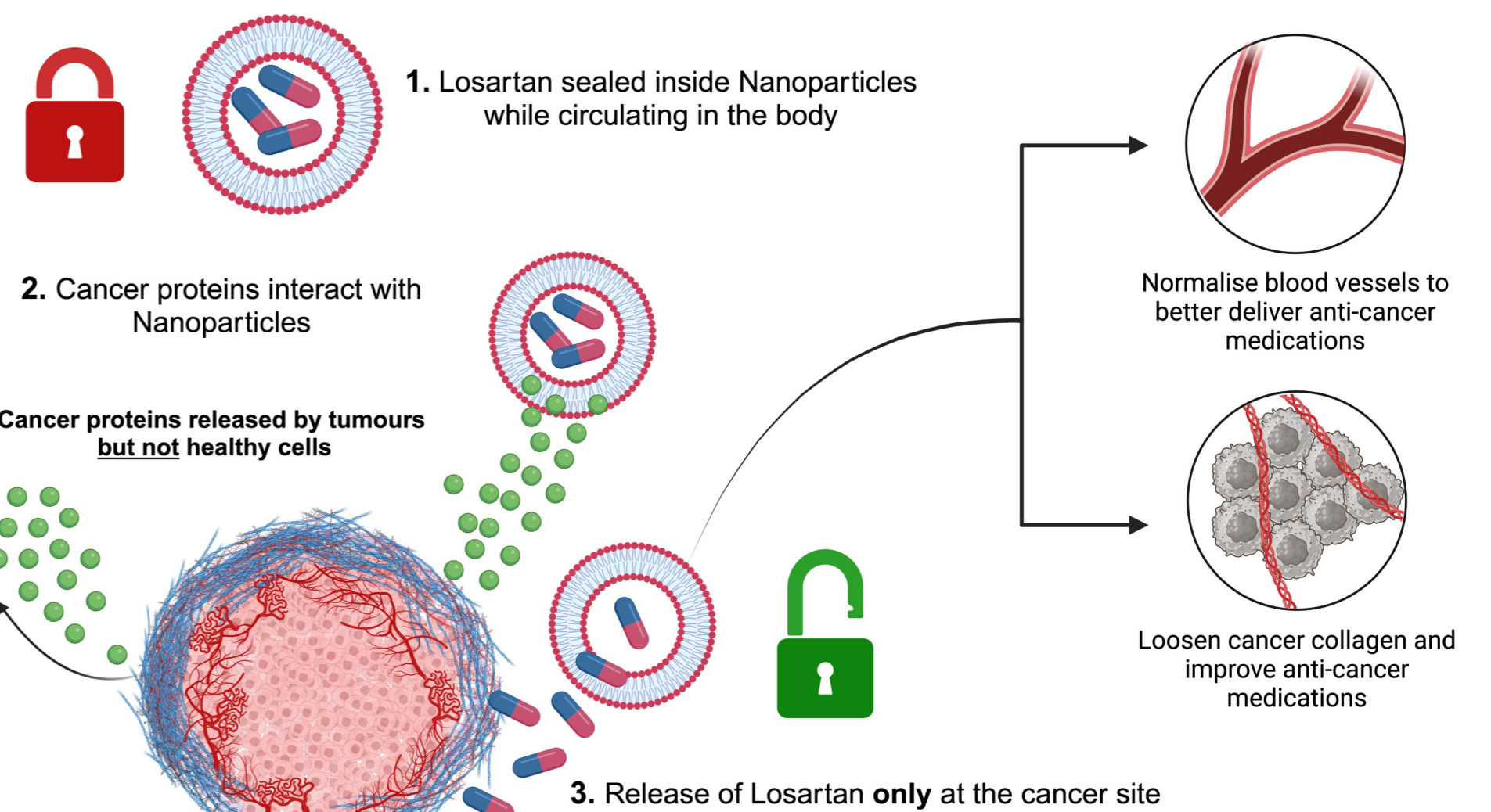
Nanoparticles can be engineered to only release medicines at the cancer site. This limits the damage done to other healthy tissues, and therefore reduces side-effects. Their small size also allows them to get deep inside tumours.



#### Will my body not just destroy them?

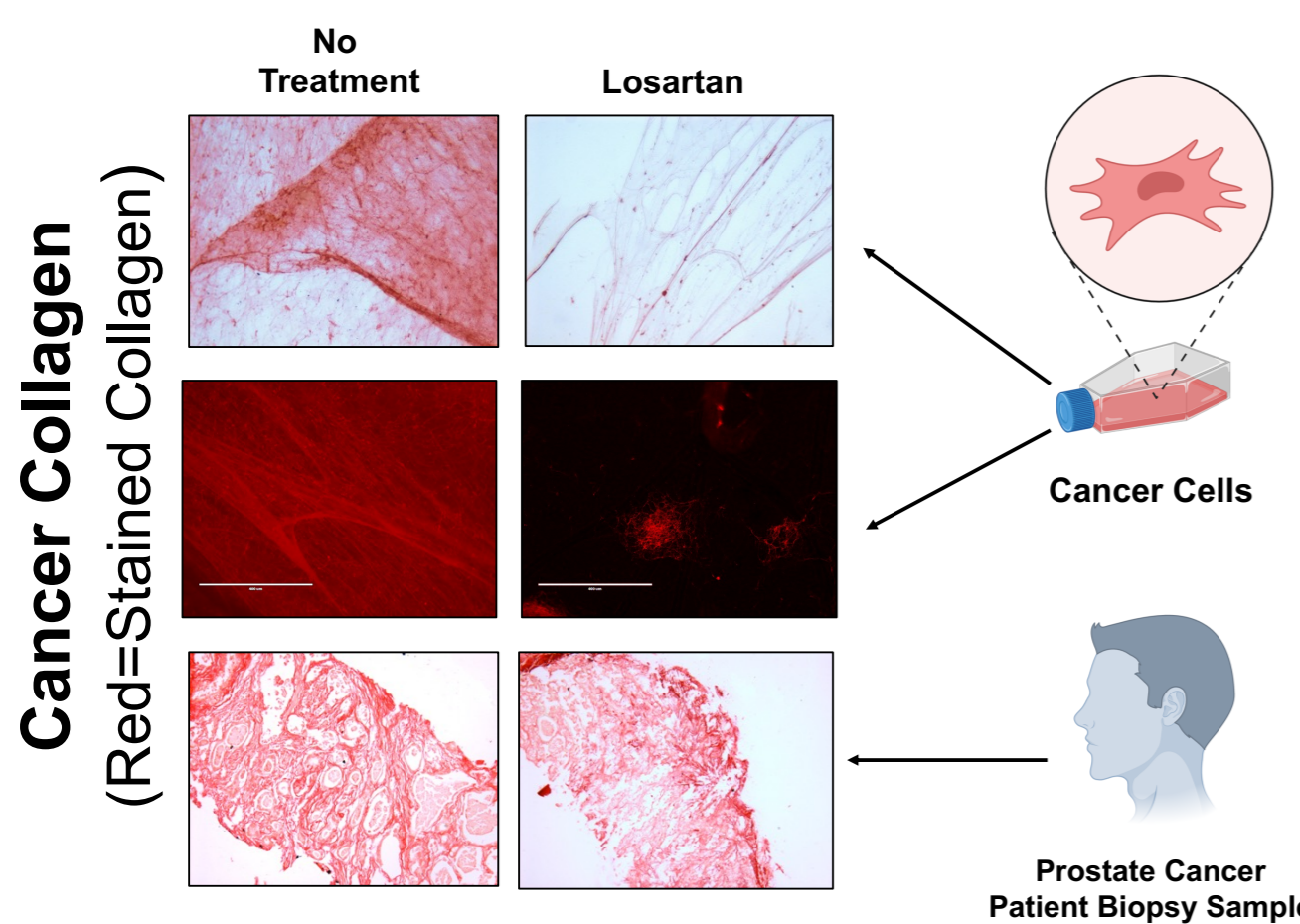
As lipid nanoparticles are derived from fat molecules, this does not trigger the immune system.

### Targeted Losartan Loaded Nanoparticles

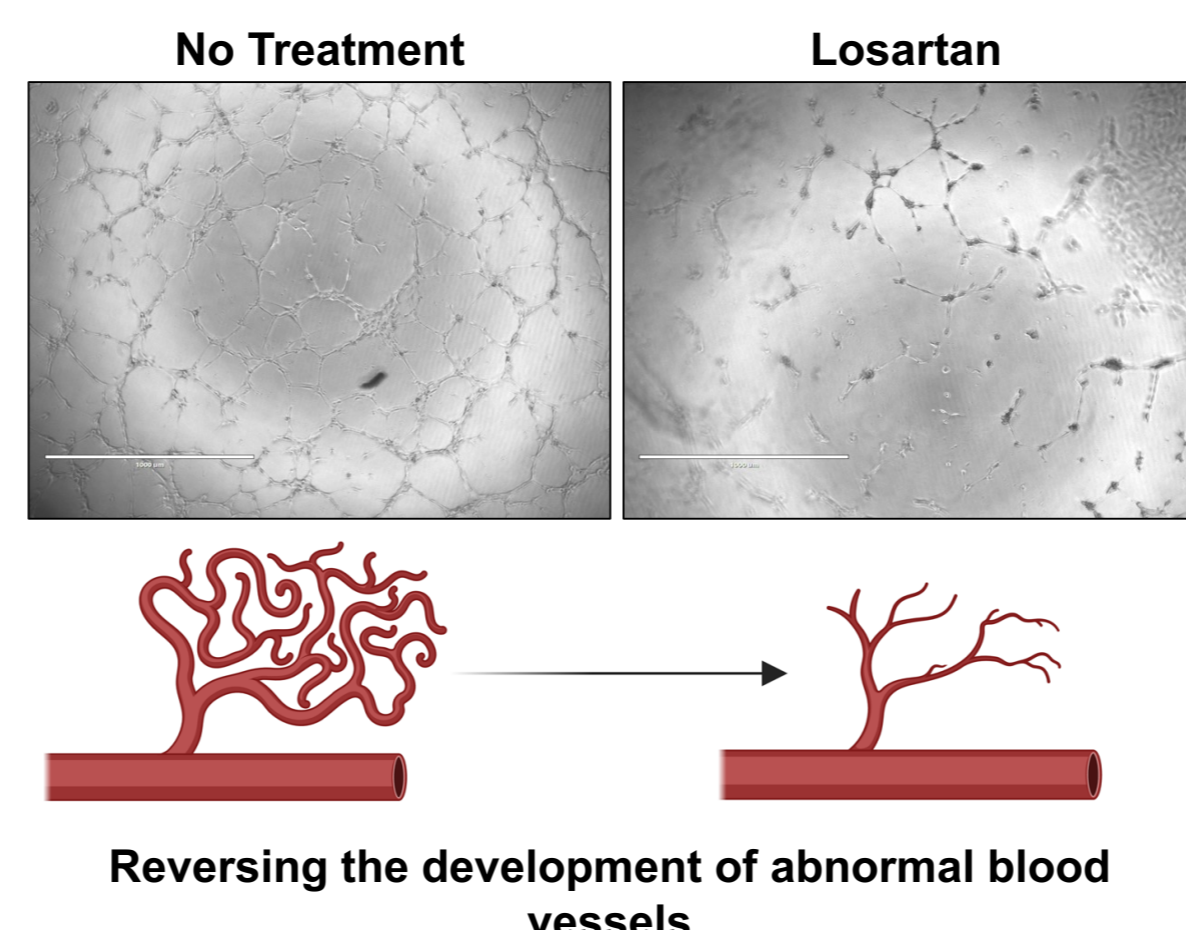


## Our Findings

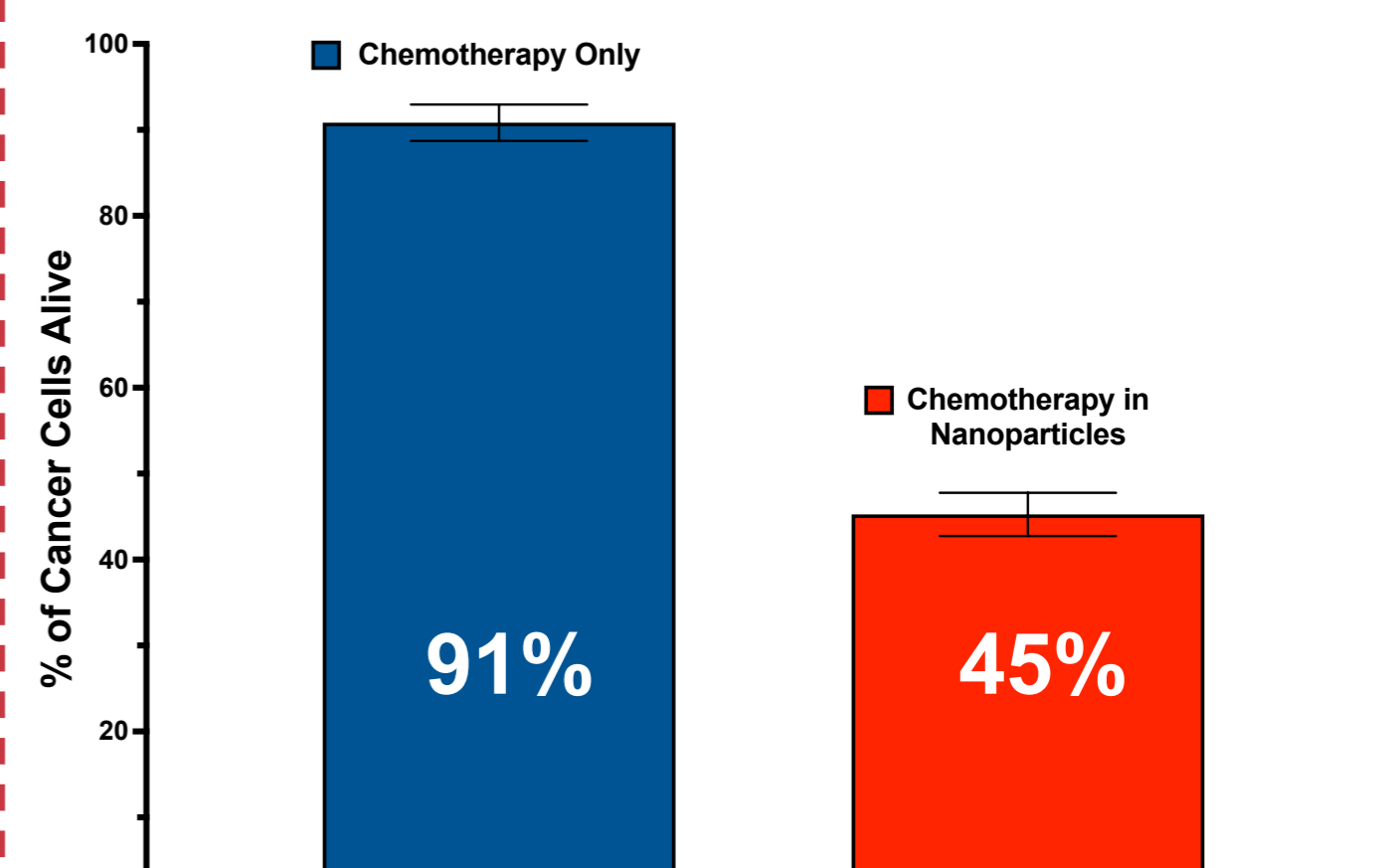
### 1. Losartan Reduces Collagen in Prostate Cancer



### 2. Losartan Reduces Abnormal Blood Vessels



### 3. Nanomedicines are Highly Effective at Killing Prostate Cancer Cells



## What Does this Mean for Patients?

Losartan unlocks solid tumours and gives cancer medication better access = **increasing cancer cell elimination**

Nanomedicines precisely target cancer cells = **less harmful side effects**