oral leukoplakia, possibly a precursor of oral cancer. So reinforces
the antioxidant capacity of the body could be prevent early events
in tumor development. In this regard, reports suggest reducing the
toxic effects of ROS through administration of probiotics. Probiotic
are defined as “live microbes which, when administered in adequate
amounts, confer a health benefit to the host. These strains which are
capable to limit excessive amounts of ROS in in-vivo condition,
may contribute to prevent and control several diseases associated
with oxidative stress such as cancer. Therefore, a thorough under-
standing of probiotic ingredients and their molecular mechanisms
would influence the development and selection of efficient type
of the anti-cancer probiotic strains, which was considered in this
study based on in-silico investigation on involved molecular
mechanisms.

Materials and methods: In this study, at the first step a compre-
hensive profile of antioxidant enzymes of probiotics were gathered.
Furthermore, the nucleotide and protein sequences of the selective
enzymes and related producing and affecting molecular mechanisms
in hosting bacteria were determined. The nucleotide sequences of
selective genes and corresponding proteins were retrieved from
NCBI, Uniprot, ExPASy, EMBL and then molecular analysis of these
sequences were performed via Blast under various matrix, InterPro-
Scan, Motif scan, CD search, ProtParam, and MEGAl. 3D structure
of ROS and selected enzymes were derived and or prepared via sev-
eral Databank as well as online and offline programs including Pub-
chem, Colby, PDB, SWISS-MODEL and Modeller. Moreover, the
affinity of the enzymes to ROS were performed via PatchDock and
visualized by Pymol.

Result and conclusion: The result of enzyme profiling led to 10
key enzymes of 7 probiotic species including katE, gshR1, gshR4,
trxR, katA, katE*, sodA, sodA*, gshR and trxB with different struc-
ture, function and activity against oxidative stress. Moreover,
the results of proximity of these enzymes led to disclosure of two distinct
clusters of relationship (Figure 1).

In addition, protein sequences analysis lead to disclosure parser
domains of ROS including H2O2 to H2O and O2, superoxide radicals
to O2, as well as FAD/NAD(P)-binding domain with role cell redox
homeostasis and oxidoreductase activity in the enzymes. Meanwhile,
this analysis led to detected immune-responsive domains in the pro-
tein sequences of the KATA, KATE and KATE*. On the other
hand, docking process of selective enzyme to ROS represents high
binding affinity of them to H2O2 (Figure 2).

As showed in this figure, binding affinity of total enzyme are in
suitable condition, however SODA (Representation complex in Fig-
ure 3) and GSHR1 demonstrate more affinity. Furthermore, homol-
ogy searching led to disclosure of similar sequences of the
enzymes with high quality in various genus of bacteria including
Bifidobacterium, Lactobacillus, Streptococcus, Bacillus, Enterococ-
cus, Weissella, Pediococcus, Leuconostoc, Tetragenococcus, Pepto-
nophilus and Listeria. Overall, the elimination of ROS is one of the
key capabilities of probiotic strains of bacteria based on the presence
of antioxidant enzymes in the prevention of inflammatory diseases
and gastrointestinal cancers, which were confirmed in this study
by corresponding enzymes characterization. On the other hand,
sequence analysis led to disclosure of specific domain with cancer
prevention capacity. Moreover, homology searching identified a se-
nies of new strains of bacteria that may be used as probiotic after
experimental analysis.

Keywords: Reactive oxygen species, Cancer, Probiotics, Oxida-
tive resistance

Under-estimation and over-estimation in gastric cancer
incidence registry in Khorasan provinces, Iran

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Extended Abstract

Introduction: Gastric cancer is a disease in which the cells form-
ing the inner lining of the stomach become abnormal and start to
divide uncontrollably, forming a mass called a tumor. Gastric cancer
was 4th most common cancer among men and 5th most common can-
cer among women diagnosed in 2012 in the world, and is first com-
mon cancer among Iranian men and the 3th (after breast cancer and
colorectal cancer) among Iranian women. In medical studies, a diffi-
culty in drawing inference from categorical data is the existence of
misclassification error. Although among medical indexes, incidence
is a familiar projection in the assessment of the burden of diseases,
the presence of misclassification error makes the registry systems
inaccurate and unreliable to use for estimating the burden of disease
and other epidemiological criteria, and consequently flaws the plan-
ing for cancer prevention. Misclassification error is the disagreement
between the observed and the true value and occurs when new cancer
cases diagnosed and registered in neighborhood provinces instead of
their hometown due to low facility in their own provinces and differ-
ence of quality and quantity of registration system in different prov-
ces. As the evidence, the expected coverage of cancer incidence in
different provinces can be mentioned; that the observed rate of inci-
dence is high than expected in some provinces, on the other hand, it is
much lower than expected in neighboring provinces. However it hap-
pens while we expect that the rate of cancer incidence be about the
same in neighboring provinces that are quite similar in environmental
conditions and lifestyle. In the absence of a gold standard, statistical
methods help to overcome this problem. There are two approaches
to reduce the effects of misclassification error; the first is using a small
validation sample and the second is a Bayesian analysis which pro-
vides subjective prior information for the subset of the parameters
for re-estimate and corrects the statistic.

Materials and methods: Data for this study were extracted from
Iranian annual national cancer registration report in 2008. The Age
Standardized Rate (ASR) due to gastric cancer (coded according to
the 10th revision of the International Classification of Diseases [ICD-
10; C16]) were expressed as rate per/100,000 population for male
and female of North, South and Razavi Khorasan. To correct the mis-
classification effect, a Bayesian approach was used with Poisson count
regression. To perform Bayesian inference, we assumed an informative
prior distribution for the misclassified parameter. Because the
discretized parameter is unknown, a latent variable approach was
employed to simplify the full conditional models and estimate the pos-
terior distribution using a Gibbs sampling algorithm. Expected cover-
age of each province was used as priors for the parameters of beta
distribution. Analyses were carried out using R software version 3.2.0.

Result: All incidence records due to gastric cancer for Khorasan
provinces that have registered at Iranian annual national cancer regis-
tration report in 2008 were included in this study. The reported per-
cent of expected coverage of cancer incidence for Razavi Khorasan

Materials and methods: In this study, at the first step a compre-
hensive profile of antioxidant enzymes of probiotics were gathered.
Furthermore, the nucleotide and protein sequences of the selective
enzymes and related producing and affecting molecular mechanisms
in hosting bacteria were determined. The nucleotide sequences of
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NCBI, Uniprot, ExPASy, EMBL and then molecular analysis of these
sequences were performed via Blast under various matrix, InterPro-
Scan, Motif scan, CD search, ProtParam, and MEGA6. 3D structure
of ROS and selected enzymes were derived and or prepared via sev-
eral Databank as well as online and offline programs including Pub-
chem, Colby, PDB, SWISS-MODEL and Modeller. Moreover, the
affinity of the enzymes to ROS were performed via PatchDock and
visualized by Pymol.

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key enzymes of 7 probiotic species including katE, gshR1, gshR4,
trxR, katA, katE*, sodA, sodA*, gshR and trxB with different struc-
ture, function and activity against oxidative stress. Moreover,
the results of proximity of these enzymes led to disclosure of two distinct
clusters of relationship (Figure 1).

In addition, protein sequences analysis lead to disclosure parser
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to O2, as well as FAD/NAD(P)-binding domain with role cell redox
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key capabilities of probiotic strains of bacteria based on the presence
of antioxidant enzymes in the prevention of inflammatory diseases
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sequence analysis led to disclosure of specific domain with cancer
prevention capacity. Moreover, homology searching identified a se-
nies of new strains of bacteria that may be used as probiotic after
experimental analysis.

Keywords: Reactive oxygen species, Cancer, Probiotics, Oxida-
tive resistance
was 155.5%. It means that Razavi Khorasan have covered 55.5% more new cancer cases than its expectation, whereas the North and South Khorasans have just covered respectively 34.8% and 41.4% of their expected coverage; which clearly is an indication of existence of misclassification error. After implementation of the Bayesian method, it was found that there was about 34% misclassification in gastric cancer incidence registry from North and South Khorasans in Razavi Khorasan. After the correction, it is expected to increase in the rate of gastric cancer in north and south Khorasans and decrease in its rate for Razavi Khorasan.

**Discussion:** Accurate cancer incidence data are essential for planning, monitoring and evaluating national and regional cancer control programs. In Iran, there are provinces with higher or lower incidence of gastric cancers and policy makers employ these data to allocate the facilities and resources according to these incidences statistics. When the cancer incidence data is regionally misclassified, underestimation of health risk in some provinces and overestimation for some others will happen. This problem leads to misallocation of resources. So in planning for resource allocation, authorities should notice that, low incidence of gastric cancer in North and South Khorasans, do not mean that they are in a good health situation and gastric cancer incidence is really low in these provinces, but quite the contrary, this may be the effect of misclassification error and it is needed to allocate them more health facilities and health centers, and improve the registration system accuracy, especially in terms of patients permanent residence. Improving the quality of the cancer registry in Iran will require more expert staffing, refining foundations, and powerful hardware and software resources. In the absence of valid data, Bayesian approach would be a good and flexible alternative to eliminate the effects of misclassification in incidence registry data for neighboring provinces.

**Keywords:** Gastric cancer, Misclassification error, Bayesian method, Incidence, Cancer registry

**Epidemiological risk factors of breast cancer in Qazvin at 2013**

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**Extended Abstract**

**Introduction:** Breast cancer is uncontrolled growth of abnormal cells that occur in different areas of the breast. This might happened in different kinds of tissue such as ducts that convey milk, milk producing tissue or non-glandular tissue. The incidence of various types of cancer varies among different populations and is in connection with factors such as occupation, society, culture, race (possibly hereditary), geography and nutrition. Research in the field of breast disease is very broad because the disease mostly affects the women who are the main hub of the family and improvement in quality of their life is equal to improvement of the quality of the community which they are involved.

Each year there are quite a number of breast cancer patients who die. According to study of glooban which was conducted by the International Agency for Research on Cancer affiliated with the World Health Organization in 2010, about 1,050,300 new cases of breast cancer has occurred that about 44% of them occurred in developing countries and its incidence is increasing in these countries. In Iran breast cancer with prevalence of 21% among all cancers in women, is the most common cancer that is listed in this gender. Risk factors for breast cancer include a wide range of factors from molecular level to the social factors that can vary between different communities.

Based on extensive worldwide research, a part of breast cancer is hereditary. Due to the occurrence possibility of this type of cancer among generations, today many experiments in breast cancer clinics in the world are being conducted with molecular and genetic techniques that promote the quality of service to the public in the early diagnosis, identification of people at risk, determine the likelihood of treatment response, survival and etc.

**Purpose:** The difference in the incidence of cancer in different regions of the world, bring up the need for studies in different areas to clarify effective factors. The purpose of this study is to evaluate the epidemiological risk factors of breast cancer in Qazvin.

**Materials and methods:** This cross-sectional study was from 2010 to 2012 on women who had made an appointment to go to the hospitals of Qazvin for annual health care. This study was conducted by trained personnel with a standard questionnaire containing questions of risk factors of cancer, demographic factors and physiological factors. Then the data are given to SPSS software and logistic regression &chi-square test analysis were performed.

**Result:** In this study, participants with a mean age of 48.23 ± 5.29 (range: 30 – 65) years old. Most people were in the age group between 45 and 55 years (40%). The average weight of participants was 67 ± 6.7kg, the maximum and minimum weight was 108 kg and 45 kg respectively. Most people (59%) were in the weight categories of 60 to 80 kg. 56% of women with breast cancer have family history of the disease and 32% of them had a history of menstrual disorders, between this disorder and breast cancer risk was not statistically significant co-relation.

<table>
<thead>
<tr>
<th>Risk factor</th>
<th>time</th>
<th>β*</th>
<th>p-value</th>
<th>OR</th>
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<tr>
<td>Secretion from the breast</td>
<td>Bloody infectious</td>
<td>38.6</td>
<td>≤.001</td>
<td>1/8 (4/1-2/2)</td>
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<tr>
<td>OCP consumption</td>
<td>Yes</td>
<td>46.5</td>
<td>≤.002</td>
<td>3/2 (7/2-98/)</td>
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<td></td>
<td>No</td>
<td></td>
<td></td>
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<tr>
<td>Positive family history</td>
<td>Yes</td>
<td>52.8</td>
<td>≤.000</td>
<td>9/8. (23/1-45/)</td>
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<td></td>
<td>No</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>Younger than 55</td>
<td>33.6</td>
<td>≤.03</td>
<td>67/1 (67/1-40/)</td>
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<td></td>
<td>Older than 55</td>
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<td></td>
<td></td>
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<tr>
<td>Weight</td>
<td>Less than 80</td>
<td>24.6</td>
<td>≤.02</td>
<td>13/1 (44/1-89/)</td>
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<tr>
<td></td>
<td>More than 80</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>The economic situation</td>
<td>good</td>
<td>41.3</td>
<td>&lt;.001</td>
<td>58/1 (93/-33/)</td>
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<td></td>
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</tr>
<tr>
<td></td>
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