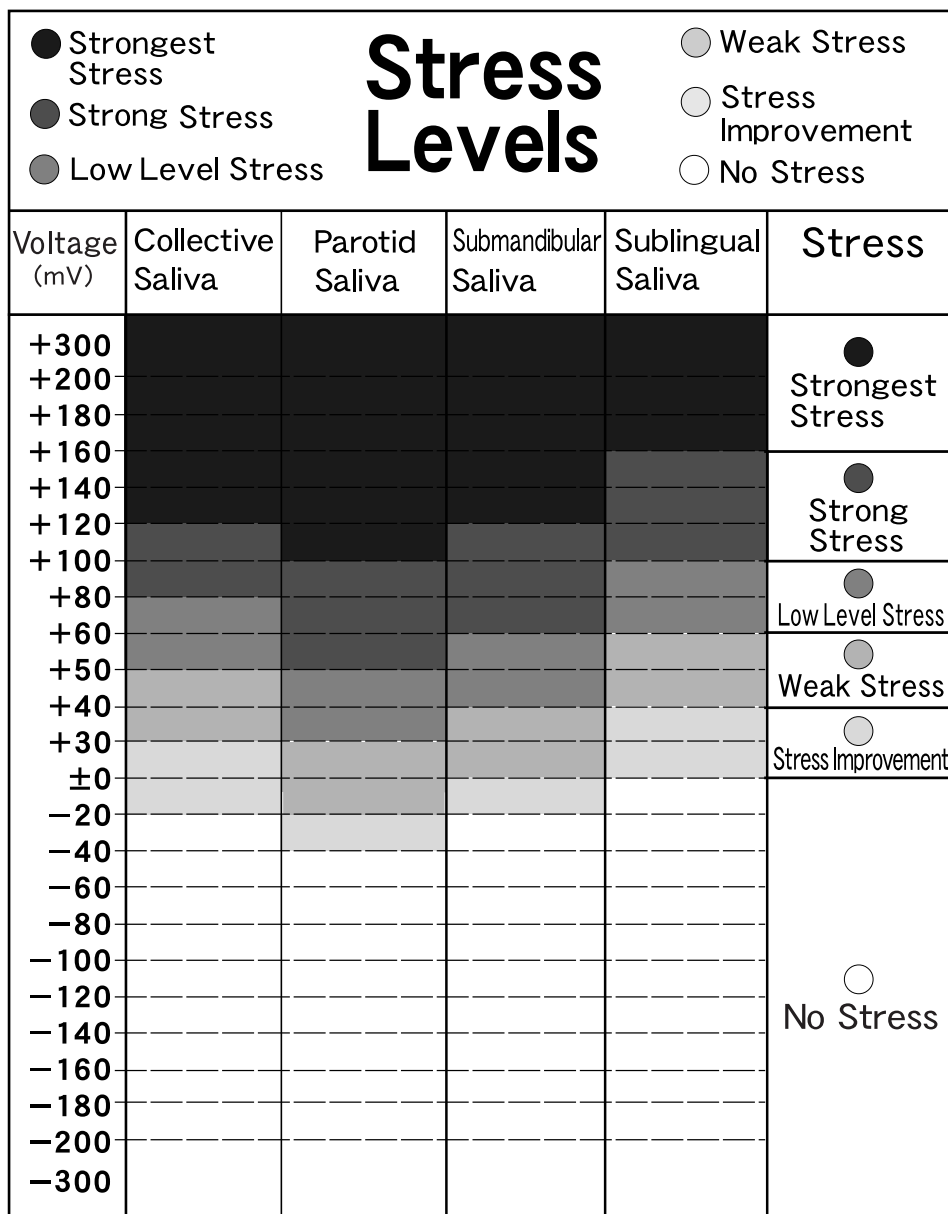


limited singular saliva components, in the present situation, the medical specialized agencies recognize that the risk of overlooking will be high with this screening examination procedure.

From the long years of saliva ORP clinical research, the joint authors are confident that there is a high possibility that the saliva ORP index will be useful in the mental care.

In the past, because there wasn't any other way to make objective quantitative judgment on depression except for medical examination by interviews, there were problems with fraudulent depressive patients who have claimed themselves of having depression.

## (2) Quantification of Stress Levels Using Saliva ORP



It seems as if they have taken advantage of the present situation that said to have difficulties in general, of not being able to make quantitative judgment of the treatment process of mental illnesses, they would reject the transfer of position from their company and organization, and claim that since they are carrying the burden of mental illness, the possibility of aggravating the depressive symptoms would be higher if they have to work under unfamiliar environments because of stress. Such claims of noncompliance of company and organization business orders







seem to be occurring frequently and this situation is shaking the foundation of business organizations.

Also, in the present situation, there seems to be many people who don't want to get out of the disease treatment even though they have recovered completely. They would make a self-assessment that they have not yet recovered from the disease and seek consolation from the surrounding people.

## ORP Quantitative Judgment of Large Quantity of Free Radical Production From Intake of Awakening Drugs (i.e. Methamphetamine) An Application to Screening Tests

I will be discussing about the next generation of ORP measuring device. Up to now, the doping tests of the athletes participating in various sports, beginning from Olympics and Paralympic Games, were done by athletes taking their clothes off in front of the doping test officials and to take their urine samples. This procedure gave the athletes strong reluctance, and also in the situation of verifying the awakening drugs response, since there are legal limitations, an easier method of verifying these drug usage was necessary.

### (3) Quantification of Chemical Screening Inspection Using Saliva ORP

<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: left;"> <p> Strong Oxidation Reaction</p> <p> Weak Oxidation Reaction</p> </div> <div style="text-align: center; font-size: 2em; font-weight: bold;">Screening Test</div> <div style="text-align: right;"> <p> Reductive Range With No Problem</p> </div> </div>			
Voltage (mV)	Collective Saliva	Parotid Saliva	Stress Judgment
+300			 Strong Oxidation Reaction
+200			
+180			
+160			
+140			
+120			
+100			
+80			 Weak Oxidation Reaction
+60			
+50			
+40			
+30			 Reductive Range With No Problem
±0			
-20			
-40			
-60			
-80			
-100			
-120			
-140			
-160			
-180			
-200			
-300			

The oxidation response of the body with saliva ORP: (1) it will indicate a strong oxidation value even with the healthy person, if the subject is affected by a strong mental stress; (2) it will also indicate a strong oxidation value due to the reactive oxygen when the person is affected by chronic diseases, or temporarily affected by poor physical health; (3) the awakening drugs have strong toxicity and it will generate a large amount of reactive oxygen, and with this, we have speculated that it will show the same response as (1) and (2). We have verified that with Graph 1- 4 later in this chapter.

However, in order for us to make it very clear about what has caused the strong oxidation value of (1)~(3), it necessitated us to implement a method to measure the saliva ORP for this purpose.

The method is this. There are three large salivary glands that secrete saliva inside the oral cavity. The first is the parotid glands, second, submandibular glands and third, sublingual glands. We have noticed that the salivary components that are secreted from each of the salivary glands have different oxidation and reduction potential responses.

To prove that the aforementioned intake of the awakening drugs will show a strong saliva ORP oxidation value, we have paid attention to the way the main salivary components of the saliva that are secreted by the parotid glands, which are amylase, parotin, lactoperoxidase and histatin, are susceptible to the oxidation of the body.

With these testing we have found the following. The results that were comparatively verified between the saliva ORP of the parotid salivary components sampled from the previously mentioned, (1) the healthy person, and (2) the person with chronic diseases and the person who is temporarily affected by poor physical health, was compared with the case of (3); and we have speculated that the strong oxidative response of (3) can be coming from the intake of the awakening drugs. The reason for that is because, as it shows on the chart 1-4 later, during the parotid saliva ORP comparison between the aftereffect of the consumption of the vegetables that were produced without using agricultural chemicals and the consumption of the vegetables that were produced using agricultural chemicals, the later never showed a reductive negative value but always showed a strong oxidative value. Japan Patent Office certified the application of drug screening from the detailed documents and its attached saliva clinical data that are presented here, and the patent was registered in December of 2017.

As far as the drug intake situation of the sports competition is concerned, by conducting the conventional drug response testing and the saliva ORP measurement side by side, it will not be necessary to subject all the athletes to the urine test because the saliva ORP can be used to screen only the athletes who are in question of drug intake.

When the drug response test is done only for the athletes who have been screened by the saliva ORP measurement, we believe that we are able to heighten the efficiency of the test and decrease the humiliating experiences of the athletes when removing their underwear to collect the urine sample in front of the testing officials.

Among the so-called narcotic drugs, there are awakening drugs, opium, morphine, heroine, MDMA/ MDA, cocaine, organic solvent such as paint thinner, and other dangerous drugs.

The abusive intake of these drugs will make the response of the body cells to become oxidative, especially with awakening drugs that mix artificial chemical substances, methamphetamine. By taking in these artificial substances into the body, we believe that a large quantity of reactive oxygen will be generated.

Please refer to Graph Chart 1 below to see the reasons for confirming the body stress level depending on the location and types of saliva that are sampled.

[Graph Chart 1]  
Reason to Verify That the Body Stress Level Depending on the Location and Type of Saliva That Was Sampled

Type of Saliva	Salivary Components with Larger Proportion	Characteristics of Saliva Components	Symptoms when Saliva is Oxidized	Symptoms when Saliva is Reduced
Parotid	<ul style="list-style-type: none"> <li>● Amylase</li> <li>● Parotin</li> <li>● Lactoperoxidase</li> <li>● Histatin</li> <li>● Ptyalin</li> </ul>	<ul style="list-style-type: none"> <li>● All of the secreted cells of parotid glands consist of serous cell</li> <li>● Secreted saliva: serous fluid that is thin and low viscosity</li> </ul>	<ul style="list-style-type: none"> <li>● Oxidation of saliva components from parotid glands: condition of high stress burden</li> <li>● Serious symptoms of Sjogren's syndrome will become high</li> <li>● Decline of appetite, decline of vigor</li> <li>● Decline of thinking faculty and concentration power</li> <li>● Not feeling well</li> <li>● Lack of interest</li> <li>● Hard of sleeping, more of complaints typical of depression</li> </ul>	<ul style="list-style-type: none"> <li>● Reductive saliva components from parotid glands: low viscous saliva, makes swallowing and speech smooth</li> <li>● Dissolves bad breath</li> <li>● Low viscous saliva becoming dominant: the swallowed saliva makes the body cycle go smooth and lessen the burden of organ functions, it is indicated by strong reductive reaction of (ORP) of saliva.</li> <li>● Stress burden caused by serious depressive condition will improve: it is indicated by strong reductive reaction (ORP) of saliva</li> </ul>
Submandibular	<ul style="list-style-type: none"> <li>● Albumin</li> <li>● Cortisol</li> <li>● Lysozyme</li> <li>● IgA</li> <li>● Lactoferrin</li> <li>● Gustin</li> </ul>	<ul style="list-style-type: none"> <li>● Serous secretory fluid (saline, protein, and other watery component with enzyme)</li> <li>● Mixed saliva with mucous secretory fluid</li> </ul>	<ul style="list-style-type: none"> <li>● Oxidation of saliva components of submandibular glands: condition of high stress burden of the autonomic nerve</li> <li>● Sticky condition of saliva puts burden on stomach and other organ's function</li> <li>● Continuation of extreme stress burden of lifestyle: cause of massive increase of reactive oxygen</li> <li>● Easy to get tired, irritation</li> </ul>	<ul style="list-style-type: none"> <li>● Reductive saliva components from submandibular glands: indicates that the stress burden of the autonomic nerve</li> <li>● This condition activates the functions of stomach and other organs and regulates the stress from lifestyle and affects the parasympathetic nerve of autonomic nerve: it is indicated by strong reductive reaction (ORP) of saliva</li> </ul>
Sublingual	<ul style="list-style-type: none"> <li>● Mucin</li> </ul>	<ul style="list-style-type: none"> <li>● Mucosa: saliva that has high viscosity</li> </ul>	<ul style="list-style-type: none"> <li>● Oxidation of saliva components of sublingual glands: deterioration of defense function against bacteria and other factors</li> </ul>	<ul style="list-style-type: none"> <li>● Reductive saliva components from sublingual gland: indicates that its mucosa will protect from various impetus of five senses and bacteria proliferation</li> </ul>
Collective	<ul style="list-style-type: none"> <li>● Parotid glands</li> <li>● Submandibular glands</li> <li>● Sublingual glands</li> <li>● Collective saliva from other minor glands can be sampled</li> </ul>	<ul style="list-style-type: none"> <li>● Gross evaluation of all saliva components</li> <li>● Suggests whether it's significantly oxidative or significantly reductive</li> </ul>	<ul style="list-style-type: none"> <li>● Body shows significantly strong oxidation: ability to confirm ill health</li> </ul>	<ul style="list-style-type: none"> <li>● Body shows significantly strong reduction: ability to confirm good health</li> </ul>

In order to prove this, since saliva ORP clinical study cannot be done for the habitual users of awakening drugs, we have conducted a clinical study, by using the graph data below that comparatively verify the local saliva ORP condition of before and after of the intake of chemical/non chemical substances, whether the condition is under stress burden or the condition is in good condition without stress burden mentally or physically, with the assumption that the comparative responses will be resulted with the awakening drugs.

Especially with the saliva substances that are produced by parotid glands, a healthy person who is in a good physical condition that has oxidation and reduction potential of under +30mV in the negative potential range, when food and drinks that used a large amount of chemical substances, such as agricultural chemicals, are consumed, it will show strong positive oxidation and reduction potential (mV) value; this was one of the observations that was incorporated into designing the new ORP measurement device, ORPreader.

The abusive drug usage has been increasing among the younger generations in the recent years. The chemical reaction of the drugs is proportional to the intake of the chemical substances, such as agricultural chemicals: larger the amount of chemical substances, stronger the oxidation and reduction potential (mV) shows, which implies a high volume production of free radicals; this can be applied to be used in screening test of body oxidation that are caused by the awakening drugs.

[Chart 1]

The changes over time of saliva immediately before/after spending time in a room that was constructed from the wall material blended with fermenting substance that was extracted from plant grown without agricultural chemical.

ORP Unit=mV

Subject	Age	Gender	Local Saliva	Before Entering the Room	Within 1 min.	After 30 min.	After 40 min.	After 50 min.	After 60 min.
A	40's	F	Parotid- R	16	-12	-13	-16	-14	-28
			Parotid- L	13	-14	-15	-15	-19	-32
			Collective	46	22	-5	-6	-8	-10
B	40's	M	Parotid- R	-5	-11	-10	-16	-15	-24
			Parotid- L	-6	-14	-15	-17	-18	-22
			Collective	33	-3	0	5	3	0
C	70's	M	Parotid- R	3	-12	-14	-16	-19	-30
			Parotid- L	5	-16	-15	-18	-20	-26
			Collective	34	29	5	3	0	-6
D	20's	M	Parotid- R	-18	-22	-25	-24	-25	-31
			Parotid- L	-23	-24	-27	-28	-26	-28
			Collective	30	-5	-7	-18	-20	-10
E	30's	F	Parotid- R	-17	-6	-14	-17	-19	-31
			Parotid- L	-12	-14	-18	-21	-20	-24
			Collective	21	-2	-11	-17	-12	-27

[Chart 2]

The changes over time of saliva immediately before/after spending time in a room that was constructed from the wall material blended with paint thinners.

ORP Unit=mV

Subject	Age	Gender	Local Saliva	Before Entering the Room	Within 1 min.	After 30 min.	After 40 min.	After 50 min.	After 60 min.
A	20's	F	Parotid- R	-2	51	35	37	38	44
			Parotid- L	-4	50	38	38	35	41
			Collective	33	65	77	72	81	98
B	50's	M	Parotid- R	-9	46	33	38	39	44
			Parotid- L	-10	51	33	41	40	47
			Collective	26	68	72	75	83	97
C	20's	F	Parotid- R	2	49	41	40	45	48
			Parotid- L	0	50	37	39	42	45
			Collective	46	84	86	85	83	111
D	60's	F	Parotid- R	-3	54	35	31	36	41
			Parotid- L	-6	48	32	27	33	39
			Collective	18	71	75	77	91	101
E	30's	M	Parotid- R	-4	45	39	41	44	49
			Parotid- L	-1	48	41	43	50	51
			Collective	31	82	85	86	96	104

[Chart 3]

The changes over time of saliva immediately before/after consuming lemon grown without agricultural chemical that have not used preservatives, fungicides and anti-drying agents.

ORP Unit=mV

Subject	Age	Gender	Local Saliva	Before Consumption	Within 1 Min. of Consumption	After 30 min.	After 40 min.	After 50 min.	After 60 min.
A	20's	F	Parotid- R	-6	-78	-58	-55	-19	-14
			Parotid- L	-5	-77	-61	-49	-22	-17
			Collective	33	-84	-50	-38	-19	-20
B	50's	M	Parotid- R	12	-76	-54	-42	-37	-24
			Parotid- L	12	-70	-49	-43	-41	-19
			Collective	56	-69	-72	-66	-37	-4
C	20's	F	Parotid- R	-7	-67	-59	-55	-50	-27
			Parotid- L	-8	-64	-60	-51	-46	-31
			Collective	27	-89	-50	-38	-19	-22
D	60's	F	Parotid- R	-1	-109	-100	-53	-38	-11
			Parotid- L	-2	-97	-95	-54	-42	-8
			Collective	54	-94	-63	-30	-14	2
E	30's	M	Parotid- R	-11	-79	-66	-39	-28	-22
			Parotid- L	-10	-86	-70	-43	-24	-19
			Collective	29	-100	-64	-56	-37	-3